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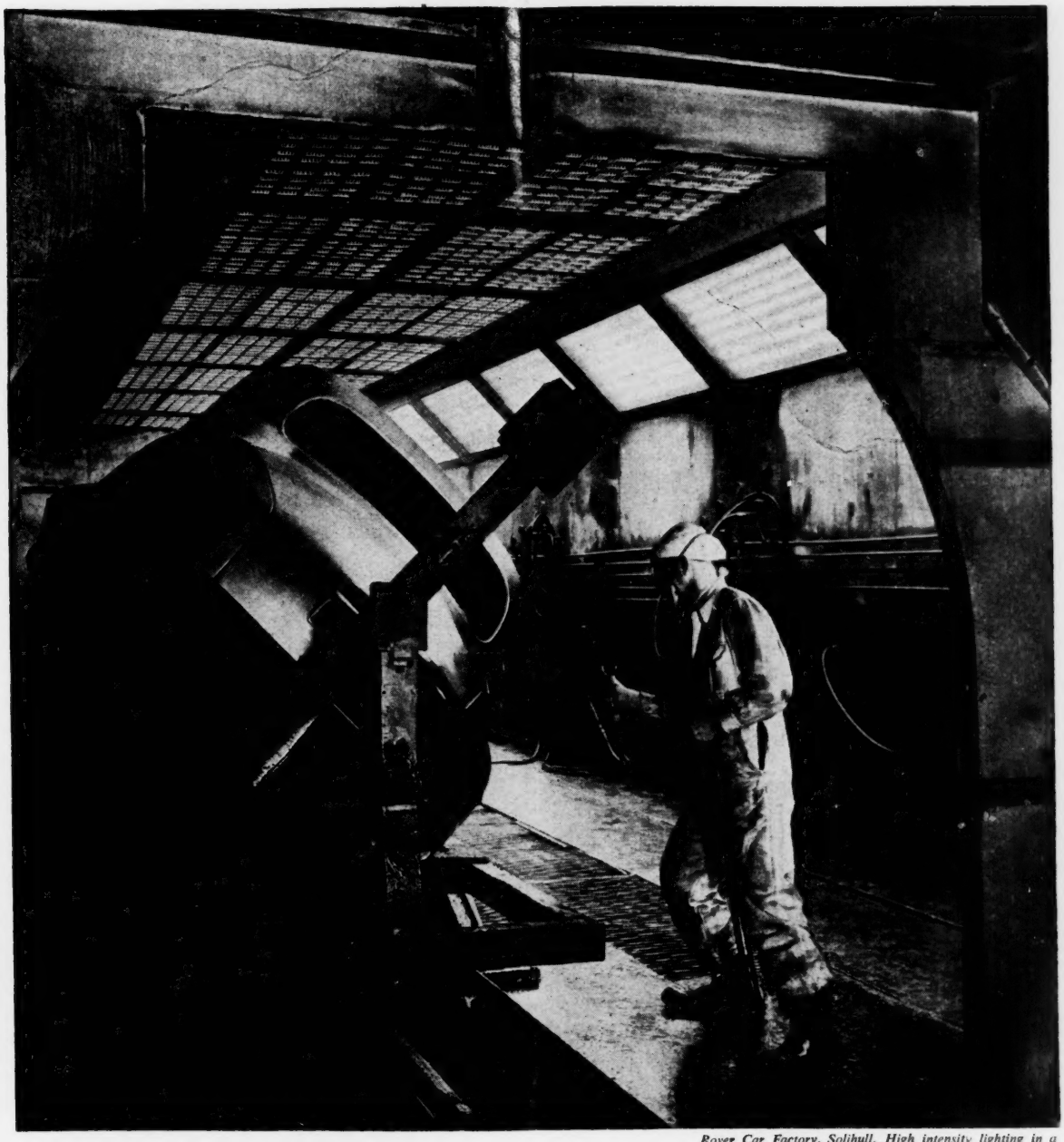

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NOTES AND COMMENTS

British Guiana — A Danger Signal

In our issue of October 9 the " Portent of British Guiana " was discussed. Since then the position in that Colony has figured largely in the news. A White Paper [Cmd. 8980] was published on October 20 and this was followed by a debate in the Commons two days later. These fully revealed the seriousness of the political situation there and justified the urgent steps the Cabinet had taken to preserve public order, which has resulted administratively in the suspension of the constitution which was only introduced last April.

In view of the revelations regarding the formation of a conspiracy to set up a Communist Government, and steps to create public disorder, there is bound to be considerable public disquiet regarding the political sagacity and alertness of those responsible for administering Colonial affairs. Clearly the gravity of the situation in British Guiana was not fully recognized when the new constitution was put into effect and a certain measure of anxiety must remain as to whether in the light of British Guiana experience grants of full self-government are not being over-expedited.

So far as the Colony itself is concerned, the basic difficulty of its poor economic position has been accentuated. As regards the possibility of the industrial situation being relieved by the development of new mineral undertakings, this has obviously had a severe setback. The White Paper mentions that the KennaMetals International S.A., abandoned its permit to explore for columbite/tantalite on June 30 ; the New York Alaska Gold Dredging Company withdrew on September 3 ; the Gulf Oil Corporation withdrew an application for an oil exploration licence on August 27, the Panhandle Oil, Canada, Ltd., also abandoned prospecting and the backers of a substantial building project ceased any further negotiations with the then Government. Not only the sugar industry but also building, the timber mills and the lumber industry all reported a let-up in activity.

It may be that the vigorous action taken by the British Government may reassure the interests of parties already committed to development projects—indeed, already the Morabisi Mining Co. has stated that its $1,000,000 programme for columbite prospecting will be continued—but other possible *entrepreneurs* who might be attracted to the investigation of mineral resources in the Colony will now think twice about entering on a field where without large capital expenditure no effective results are likely.

Point is given to this consideration by recent reports from our Canadian correspondent which give some fundamental grounds for the confidence with which capital is forthcoming for investment in the mining industry there. One of these is the stability of government and the sound administration under which it is conducted. In pre-war days in the Dominions and Colonies of the British Empire a broad continuity of Government policy was assumed and this guarantee was a major incentive for overseas investment. This assurance is in many cases wanting to-day as witness current happenings in British Guiana, Sierra Leone and British Honduras. More widely still, what are the inducements for British investors to provide risk capital in India, the Sudan and Egypt and even in Southern Africa with the political and economic situation so obscure ?

Self government must stimulate nationalistic sentiment and the desire to supplant British Colonial administration by a native one. But in the less developed states there is no trained civil service capable of taking its place and the cancellation of the British Guiana constitution is a warning that more haste generates less speed. We see the guarantee of respect for earlier established rights becoming endangered ; especially is this the case where new administrations will have to find finance for their functioning. In some cases the mineral industry is one of the chief economic supports of a working economy and therefore is especially liable to feel the repercussion. In the past, in order to induce strong financial houses to adventure their resources in untried fields special inducements were requisite and Government public works and the inducement of special prospecting and development concessions were normal steps towards the economic development of latent national resources.

What guarantee now exists that these will be respected by native administration, intoxicated by the heady wine of new-found freedom, and wishing to " paddle their own canoe " while lacking political experience and sense of responsibility ? The agitation in Sierra Leone to revise the diamond mining concessions illustrates how quickly an issue involving exploitation of natural resources may

emerge. The example of Bolivia in expropriating the great private interests which have given that Republic an economic place in the world is an invitation to newly-enfranchised and politically raw comumnities to do likewise.

Meanwhile it is encouraging to note that a repetition of the events witnessed in British Guiana is not likely to arise in the Gold Coast. This at any rate would seem the logical deduction from the recent action taken by Dr. Nkrumah, the Prime Minister of the Gold Coast, in suspending from his party, the Convention People's Party, two members suspected of working in the interests of Communism. Dr. Nkrumah's view of such activities was made clear when he said, " It is not in the best interests of our country for any nationalist engaged in the struggle for independence to allow himself to be used by a Communist organization." This forthright declaration can be read as yet another clear indication that the C.P.P. have only the interests of the Gold Coast at heart and that the Gold Coast Government is steering the Gold Coast's nationalist movement slowly but surely towards its objective of full political responsibility.

Gold Premium at Vanishing Point

The free market price for gold, which is currently hovering around $35.75 per f.oz., is at the lowest level since the establishment of the post premium market.

A year or two ago when the free market price was showing a substantial premium it was generally agreed that its buoyancy could be traced to several distinct influences. The chief source of demand came from the Far East, where the persistent purchase of gold for hoarding was used as a hedge against a volatile fiscal system allied to an unstable political situation. This same comment could be applied, in a general way, to several Continental countries but more particularly to France whose demand for gold appeared to vary in direct proportion to the frequency of changes of Government and the volume of rumours concerning the impending devaluation of the franc. These two sources of demand were sufficiently strong to set the tone of the market and governed, in large measure, the premium level obtained in India where the price on the Bombay bullion market, because of the ban on the import of gold, commanded a useful premium over the recognized premium available in other free market centres. Moreover, the well known " dollar gap " was much in evidence at that time thereby focussing attention on the vagaries of the premium market, as Governments were not above participating in free market transactions to strengthen their gold reserves or to obtain convertible currency to buy much needed dollar goods.

With the premium price on the free market now well below $36 per f.oz. the question is whether the drying up of demand from the foregoing sources has been the cause of the decline, or whether there are any new factors to be taken into consideration. Broadly speaking, it would appear that the present low level to which the premium has fallen is directly due to a reversal of the forces which formerly caused the substantial premium over the official price.

The end of the war in Korea effectively sealed off the former points of entry for gold and the demand for gold simply dried up. While it would not be difficult to establish several good reasons how and why demand for gold from this source vanished with the advent of peace, it is more difficult to understand why French demand has also petered out. Certainly the political situation has not improved, nor have the crop of rumours about impending devaluation of the franc died. In fact, the only reason that can be stated—unless readers can believe that the French have regained confidence in their Government—is that the liquid resources for such purchases have evaporated.

The effect of the withering away of demand from the Far East and France has had its impact on the Bombay bullion market and the premium price has fallen to sufficiently low levels to deter any large scale smuggling. There is, too, the fact that the more liberal trade policy adopted by the U.S. Government in their declared intentions to help close the " dollar gap " of the Western world, together with the knowledge that several European countries have been able to raise their gold and dollar reserves to post war peak levels, has all helped to turn aside attention from the gold markets. There is, however, an additional factor to be reckoned with—the sale of gold bars from the Soviet Union which have been coming on to Continental gold market centres for an unknown length of time and, for that matter, in an unknown quantity and price. Coming as this new gold supply does on top of a market already weakened, it acts with full force at the margin with the result that if the present decline continues producers will have no need to look further than their own Governments for markets.

Be that as it may, it is difficult to consider the disappearance of the premium price over the official quotation as something that was bound to happen, or of which its benefits were in the nature of a windfall and, therefore, not to be viewed as a stable factor in annual revenue. That argument might have carried some weight two years ago when no one really expected the premium price to remain at the then high levels, but as working costs continued to rise and profit margins to shrink, the additional revenue received from sales of gold on the free market came to be relied upon almost as the sole means by which the gold producers could continue to mine at economic pay limits. Nor should it be forgotten that the presence of a premium price was a strong factor in reducing agitation by the gold producers for reliefs either in the form of tax reductions, depletion allowances, or comprehensive subsidization schemes.

Now, however, even this slight relief has gone and Governments will have to consider ways and means by which the gold mining industry can continue as a reasonably profitable industrial section of their economy. The alternative is to face up to large scale unemployment within the industry, the effects of which, in a country like South Africa, could have serious repercussions over a much wider sphere.

The actual disappearance of the gold premium has extinguished, at least for the present, any hope of relief through an upward adjustment of the gold price. The gold mining lobby in the United States, though articulate and, for some purposes, powerful, could not, any more than Mr. Havenga, reasonably expect to move the Administration on this issue in the present circumstances. Indeed, although less committed on this issue, the Republican Administration has already found ways of saying " No " to a change in the gold price just as effectively as its predecessors in office.

It may, perhaps, be pertinent to point out that should the Soviet Union feel it to be in their best interests to create as much havoc in the economic systems of the free world as possible, it would seem that by the continual supply of even relatively small quantities of gold bars at the appropriate time and place they could prevent the reversal of the current trend in premium prices. The whole gold premium situation is, doubtless, now under consideration by those Governments most affected by its disappearance and it will be very interesting to watch developments over the next few months.

A Revised View of Australian Uranium Prospects

Despite the optimism with which the production of uranium in Australia has recently been regarded, dramatic results should not be expected within a few months, and Australia is by no means backing a certainty in its search for the ore. These views were expressed recently by Mr. R. G. Menzies, the Australian Prime Minister, who also pointed

out that his country might be called upon to spend millions of pounds and experience a longer time lag than was generally expected before a saleable product could be offered on the market.

Australia's existing agreements with the Combined Development Agency of the United Kingdom and the United States have been the subject of a curious rumour of late, to the effect that the Commonwealth Government should have demanded a higher uranium price from the C.D.A. Mr. Menzies pointed out that the author of the rumour could have had no knowledge of the price originally asked by the Australian Government, but the fact that the rumour has been spread at all indicates the need for secrecy in all matters concerning uranium production and sale. The rumour loses most of its force, however, when it is realized that the selling price of Australian uranium has not been disclosed owing to an agreement between the Australian Government and the Combined Development Agency.

In recent weeks it has been noted in these columns that the selling price for uranium in Australia was satisfactory to the seller but at the same time did not allow profiteering at the expense of the common defence effort. Yet much work remains to be done before the value of uranium prospects in Australia can be assessed properly. In the Northern Territory, the present major focal point of Australian activity, uranium does not lie in reefs—as far as is known—but occurs in broken country where each uranium-bearing outcrop may be no more than a pocket. Seen in this light Mr. Menzies's appeal for a more cautious optimism is more than justified.

The Coal Industry

(From Our Coal Correspondent)

At the turn of the year the coal industry was running at a heavy loss due to declining productivity and rising costs of wages and materials, and the financial position did not improve until the price of coal to home consumers was raised by 10 per cent on March 2. This involved an average increase of 5s. 6d. a ton in the pit-head price and it was estimated to yield an additional revenue of £43,000,000 to the Board. In view of this, the surpluses shown in the accompanying table are very modest ones and it does not seem likely that the increased selling price will enable the Board to do more than to make ends meet during the year as a whole. A summary of the statistical statements issued by the National Coal Board for the first and second quarters of this year is given below.

N.C.B. STATISTICS FOR FIRST HALF OF 1953

	1st Quarter	*2nd Quarter*
Output of saleable coal, tons ...	£54,919,177	£51,849,729
Colliery profits	£5,523,133	£6,308,187
Open-cast profits	£12,000	£430,000
Ancillary profits	£740,000	£300,000
Taxes, etc.	£1,660,000	£2,180,000
Interest to Minister of Fuel and Power	£4,050,000	£4,050,000
Estimated surplus	£541,133	£808,187
Cost of production per ton ...	57/3.4	59/2.7
Proceeds per ton	59/3.5	61/7.9

The National Union of Mineworkers made a formal application on October 13 for increased pay for 400,000 colliery workers to bring the minimum weekly wages of men employed underground up to £8 and those of surface men up to £7 from £7 6s. 6d. and £6 7s. 6d. respectively. This claim was rejected by the Board on the grounds that it would cost the industry another £13,500,000 a year and would involve a further rise of 1s. 6d. a ton in the selling price of coal. The Chairman of the Board gave an assurance after the March increase that the price of coal had then reached an upper limit beyond which it would not be allowed to go. Therefore the Board are placed in a considerable dilemma by the present demand for higher wages, increased costs in other directions and the prospects of a fall in revenue from exports.

The continued failure to increase productivity in spite of the campaigning carried out jointly by the Board and the Union since the beginning of the year to set up pit production committees is causing much concern and it has now been decided to find out how far this state of affairs may be due to defects in managerial control. The Minister of Fuel and Power announced in Parliament on October 26 that Area General Managers and Colliery Managers are to be given a greater degree of freedom and that an inquiry into the general organization of the Board is to be conducted with the aid of external assessors.

DEVELOPMENTS IN THE COALFIELDS

The possibility of extending mining operations in the Somerset coalfield, particularly in the neighbourhood of Bristol, is now being investigated. This coalfield is included in the South Western Division and is a highly disturbed geological region. The seams are numerous but most of them are very thin and mining has never been carried out on a large scale there. The total output last year amounted to 556,453 tons, all of which was produced at a heavy loss. The coals are of the strongly caking types which may in the future be used in increasing quantities for the manufacture of metallurgical coke. It is believed that the reserves in the Bristol area may amount to 100,000,000 tons and that the quality of the seams improves with depth. An extensive drilling programme is in progress to determine how far it will be feasible to work them. A new drift mine is being opened at Harry Stokes to the north-east of Bristol and production is due to begin there early next year. A borehole on the outskirts of the city at Downend is expected to reach a depth of 3,000 ft. Any mining here would necessitate the sinking of vertical shafts to a depth of 800 yd. and the extraction of the seams would have to be planned in conjunction with the City Authorities so that new housing sites could be developed only after the surface had settled permanently to new level after subsidence. The National Coal Board are already collaborating with local Authorities elsewhere to co-ordinate mining and building operations to eliminate the possibility of damage due to subsidence.

The extent to which the National Coal Board must co-operate with other public bodies necessarily becomes greater as time passes. An instance of this is provided by recent developments in connection with the drainage of methane at Haig Colliery in Cumberland, where arrangements are being made with the Northern Gas Board to introduce the methane into the gas grid for distribution to industrial and domestic consumers. Since last autumn increasing quantities of methane from this pit have been used for steam raising at the colliery, thereby saving over 7,500 tons of coal. It is realized, however, that methane is too valuable a fuel to be used as a substitute for low grade coal and that other uses should be found for it in the national interest. Methane has a much higher calorific value than town gas but the speed with which a flame is propagated in a mixture of methane and air is considerably lower than in coal gas and air. Therefore the admixture of methane in large quantities with town gas would cause trouble in a domestic appliance because the flame would tend to strike back into the burner. To overcome this difficulty, arrangements are being made at Whitehaven to break down the methane into carbon-monoxide and hydrogen before it enters the grid. This is to be done by passing a mixture of methane and steam over a nickel catalyst at red heat and then blending the products of this reaction with the right proportion of untreated methane to produce a gas having the same burning characteristics as town gas.

Recent Mining Expansion in the Congo

In a recent lecture on the mineral industry of the Belgian Congo and the Mandated Territory of Ruanda-Urundi, Mr. M. Marthoy, Joint Managing Director of the Union Minière, reviewed the progress of mining in Belgian territory since 1946. The following article presents a summary of his remarks.

With the exception of gold and tin, output of all minerals has largely increased in the Belgian Congo and Mandated Territory, as is shown by the table published on this page.

The increased production conjoined with rising prices increased the value of mineral exports by nearly 300 per cent to Frs. B. 12,108,000,000 last year, about 60 per cent of the Colony's total exports.

COPPER AND ITS ASSOCIATED METALS

Copper: Copper deposits of the Belgian Congo are situated in Katanga in the region bordering the frontier of Northern Rhodesia and are worked by the Union Minière. The grade of the ore is considerably higher than the average for the big mines of the United States, Chile and Rhodesia. The deposits, originally sulphides, have weathered superficially to important formations of oxides suitable for opencast working.

The Union Minière is treating both categories of mineral, the sulphides by electric smelting at Lubumbashi, and the oxides by lixiviation and electrolysis at Jadotville-Shituru. The only underground copper mine is the Prince Leopold at Kipushi. Oxidized ores are derived from several big opencasts in the Kolwezi region, more particularly the Nusonoi, Iwé, Kolwezi, Kinganyanbo, and Kamoto mines, and after concentration are shipped to the reduction works. All mines, reduction plants and concentrators are equipped to reduce to a minimum the need for labour, the chief limiting factor in the development of mineral production in the Colony.

The supply of electricity on a large scale is necessary. The Union Minière at present draws its power from three generating stations, the Francqui, the Bia, and the Delcommune rated at about 1,125,000,000 kWh., and a new station, the Marinel, is to be built on the Lualaba. This last should be commissioned in 1957 with an output of 1,400,000,000 kWh. In all the electric power generation throughout Katanga will exceed 500,000 kVA. It is distributed by a network of 550 kilometres of cable at 110,000 volts and 125 kilometres at 50,000 volts.

The Katanga copper output to-day is around 200,000 tonnes a year, 110,000 tonnes of electro and 90,000 tonnes rough copper 98.5-99 per cent. The latter is refined in Belgium at the Olen works of the Societé Générale Métallurgique de Hoboken. The output is some 7½ per cent of the world output of copper and is the principal product of the Belgian Congo, representing more than 30 per cent of the total exports. Congo ranks sixth in the list of world producers after the U.S., Chile, Northern Rhodesia, the U.S.S.R., and Canada.

For several years past the Bamoco Syndicate has been boring formations containing copper in the Bas-Congo, the exploitation of which may be expected some day.

MINERAL PRODUCTION IN BELGIAN CONGO

(In units of tonnes where not otherwise stated.)

	1946	*1952*
Copper	143,885	205,749
Tin	17,100	13,996
Cobalt	2,156	6,831
Diamonds, industrial, ct....	5,666,353	11,013,840
„ gem, „ ...	513,218	594,988
Gold, f.kg.	10,305	11,470
Zinc concentrates ...	67,024	189,388
Manganese ores	—	127,978
Wolframite, etc.	390	1,543
Tantalo-columbite ores ...	168	1,381
Coal	101,901	252,885
Cadmium, kg.	16,600	20,506
Silver, kg.	96,650	147,034
Monazite	—	14
Bastnaésite	—	214

Note.—No figures given for uranium production.

Cobalt: In certain copper deposits of Katanga, chiefly in the Kolwezi region, copper is intimately associated with a cobaltiferous mineralization, of which the grade is much poorer than that of copper, but which can still be worked at a good profit. After concentration these cuprocobaltiferous ores are treated according to their richness either by lixiviation and electrolysis at Jadotville-Shituru, or, where the percentage is higher, by electro-thermic production at Jadotville-Panda.

From these works Union Minière produces yearly some 7,000 tonnes of cobalt, 4,000 in pellets of highly refined and 3,000 as a cobalt-copper-iron alloy, which is refined in Belgium at Olen or else in the United States. The Union Minière output represents to-day about 65/70 per cent of the world's output.

Production by the wet method as employed at Shituru has called for an entirely new technique developed by the company's laboratories.

Zinc: The whole of the zinc production of the Congo is from the underground sulphides of Kipushi. Here the zinc is associated with copper in varying proportions and is recovered by differential flotation, yielding concentrates of about 52 per cent zinc. Some of the concentrates are roasted at Jadotville, and yield the sulphuric acid necessary for the hydro-metallurgical treatment of the oxydized copper-cobalt ores.

The zinc is finally exported in the form of raw and roasted concentrates to supply the Belgian zinc industry. Since the middle of 1953 Metalkat has put a plant into commission at Kolwezi to treat part of the roasted concentrates by lixiviation and electrolysis, and is producing electrolytic zinc ingots. This installation when completed will have a capacity of 40,000 tonnes of metal yearly, and marks a new stage in the progressive industrialization of the Belgian Congo.

Cadmium: The copper-zinc ores of Kipushi also contain a little cadmium. This is got from the furnace dust created by the roasting of blends and from smoke-stack recovery in the smelting furnaces at Lubumbashi. So far cadmium has only been recovered from the furnace dust in the form of sticks of refined cadmium. The mud which is derived from the furnace smokes has been stocked for several years and will eventually be treated in an annexe to the Metalkat zinc smelter.

Germanium: Germanium of very low grade occurs in certain ores of the Prince Leopold mine at Kipushi, and is recovered from the furnace smoke at the Lubumbashi smelter. The Union Minière extracts germanium, together with the zinc, lead and cadmium contained in the mud coming from the treatment of these fumes. The impure oxide thus recovered will be treated at Olen.

Silver: The Prince Leopold ores also contain small

quantities of the precious metals, the most important of which is silver. The production varies from 120 to 150 tonnes yearly.

TIN AND ITS ASSOCIATED METALS

Tin: Tin occurs in the Belgian Congo and Ruanda Urundi, both in primary formations and also in a number of alluvial and eluvial deposits resulting from the degradation of the primary occurrences. The principal producing regions are Katanga, Manièma and Ruanda Urundi. In the two latter only detrital deposits are worked. Many of the companies rely on primitive methods of treating ground, transport and washing, but others, more particularly Géoruanda in Ruanda Urundi and Symétain and Cobelmin in Maniénia are progressively mechanizing and electrifying their workings and so have effected considerable labour savings.

In Katanga, where production is mainly in the hands of Géomines, working has started on the primary deposits of hard pegmatites. Here the mines are extensively mechanized and reduction is carried out in large permanent mills embodying grinding and gravity concentration processes.

Géomines has an electric smelter at Manono which treats the cassiterite produced by the company and some of that from the Sermikat and Géoruanda companies. The smelter has turned out in recent years about 3,000 tons of tin annually. The rest of the Belgian Congo and Ruanda output is either exported to the United States or sent to the Hoboken smelter in Belgium.

Current production of cassiterite in the Congo, including what comes from the mixed cassiterite-wolframite and cassiterite-tantalo-columbite ores, amounts to about 20,000 tonnes with a metal content of about 14,000 tonnes.

Tungsten, Tantalum and Niobium: In the tin deposits of Maniéma and Ruanda, cassiterite is associated with wolframite and mixed tantalo-columbite ores and a little tantalo-columbite is met with occasionally in the Katanga formations. These mixed ores are usually electromagnetically separated and exported and sold as such. Their production has greatly increased during the last few years.

GOLD AND DIAMONDS

Gold: The gold mines of the Colony are situated principally in the eastern province and in Kivu. Very small quantities come from Kasai and Ruanda, and a few dozen kilos are recovered as a by-product in the metallurgy of copper.

The principal producers are Kilo-Moto and Grands Lacs Africains which produce about four-fifths of the total output. Of late there has been a rapid development in the number of mines working hard rock, though formerly it was entirely derived from detrital deposits. At the moment each type is responsible for about half the output.

The alluvial and eluvial workings are generally little mechanized. In many workings breaking down and transport of the gravel is still done by hand, but there is an increasing trend towards using monitors wherever possible, and towards transporting of the wash by means of trucks, conveyor belts and overhead buckets, or by hydraulic methods adapted to the local conditions. Some companies have also installed draglines.

Gold mining in the solid rock calls for considerably more plant and can only be practised where there is low cost electric power. This is particularly the case in the Kilo-Moto mines, which have three central power stations on the river Shari, and also in the Pobale plant of the Grands Lacs Africains.

The crude gold of the Congo is refined in Belgium. Present output is about 11,000 kilos a year from which it has fallen from 19,591 kilos in 1941. Producers suffer heavily from the effects of the Bretton Woods agreement, and even with the 60 per cent permitted to be sold on the free market, poorer deposits cannot be worked.

Diamonds: Diamond production in the Congo is confined almost entirely to the province of Kasai where it is generally organized by the Forminière on its own account and also for the Bécéka Company and the L'Entre-Kasai-Luebo group. Gemstones come principally from the Tshikapa area and industrial diamonds from Bakwanga. All these deposits occur in the alluvials and eluvials of the streams.

In the Tshikapa area mechanization is still primitive. In Bakwanga, however, excavation is carried out with mechanical shovels and draglines, while large earth moving equipment is used for the removal of overburden and large trucks are being rapidly introduced to transport the gravels. After washing, the concentrates are sent to the sorting plants at Tshikapa and Bakwanga where the heavy metals separation process has been introduced recently to treat the rough concentrates.

Congo production has risen recently to about 11,000,000 ct. a year. In 1937 the Belgian Diamond Board was established for the manufacture of diamond tools and of boring crowns, drills, saws, and files.

OTHER DEPOSITS

Manganese: In 1950 the production of manganese did not exceed 20,000 tons a year, but this has been largely increased through the opening up of a property owned by the Societé Bécéka Manganese situated close to the Kolwezi-Dilolo Railway which is worked as a quarry by mechanical shovels. Production rose from 16,990 tonnes in 1950 to 70,945 tonnes in 1951, and 127,978 in 1952. Given improved transport, this output could be further increased. Last year a syndicate, Fermanco, was started by a group of companies to investigate the possibility of making various ferro alloys, especially ferro-manganese, in the Colony.

Coal: The only notable coal deposits so far discovered in the Congo are those of Luena-Kisulu and others in the Lukuga basin. The first-named deposits are worked opencast and yield a good quality coal, but with a high ash content. Production has been considerably increased recently to compensate as much as possible for the short fall in supplies from Wankie collieries. In 1952 output exceeded 250,000 tonnes for the first time. At the Lukuga deposits owned by Géomines, production is being restarted after a long interval to supply material for synthetic carburants.

Uranium, Radium, Palladium, and Platinum: At Shinkolobwe, the Union Minière mines one of the most important deposits of uranium and radium in the world. The ore is treated at Olen and a little platinum and palladium is recovered.

Other Output: Sudkat has at Kengere, in Katanga, a small deposit of lead not being worked at present. Katanga also has mines yielding a few hundred tons of salt yearly. There is a small bismuth mine at Kivu and lithium has been detected at certain mines of the Géomines. Some of the tin deposits of Kivu and Ruanda produce a little monazite and bastnaésite. There are also important deposits of bituminous rock and of bituminous schists.

Finally there exists, principally in Katanga, huge deposits of iron ore which so far are not being worked owing to the shortage of fuel, but which might in the future give rise to an important steel industry producing locally a whole range of valuable special steels.

The Use of Aluminium in Silicosis Prevention at McIntyre Porcupine Mines Ltd., Ontario

Several papers read before the fifth conference of the McIntyre Research Foundation held in America early this year, presented the experiences of mining companies in their efforts to combat silicosis among underground workers. The following article is an abridgment of the paper presented by Mr. A. D. Campbell, manager of the Foundation at Schumacher, Ontario, and tells of the encouraging results obtained from the use of aluminium dust in prophylaxis and therapy. Readers will recall that in the report on the fourth annual conference of the Foundation, which appeared in *The Mining Journal* of July 11, 1952, it was stated that the effects of aluminium on cases of silicosis was the subject of laboratory study by the Medical Research Council.

No known new cases of silicosis have appeared amongst working miners of McIntyre Porcupine Mines Ltd. during the last six years, and credit for this encouraging result is largely given to the persistent application of aluminium therapy. On the McIntyre property the use of aluminium as a preventive of silicosis was discovered and here it was first used in aluminium prophylaxis and therapy through daily change-room dispersal to all working miners.

The mine is located in a band of schisted pre-cambrian rock estimated to be over 2,000,000,000 years old, with gold bearing veins made up of quartz and schist. The silica content of the ore averages 40 per cent and at some faces is as high as 90 per cent. The dust has produced silicosis.

From 1911 there has been broken and milled 23,500,000 tons of rock, with resultant dust promotion. By 1925 an average of 800 men were employed of whom 600 were in dust-exposure work. There are now 1,350 employees with 900 exposed. It is estimated that 11,000 have been employed at one time or another over the past 42 years. Any of those ex-employees who later develop silicosis in non-dusty work are assigned to McIntyre and compensated through the Ontario Compensation Board with the cost charged to gold mining as a whole.

The mine's silicosis experience is contained in the complete individual files of each case compensated for disability or allowed by the Ontario Compensation Board to be compensated as disability developed. Silicosis as referred to in this article is silicosis as diagnosed by chest X-rays and occupational and physical findings of the examining doctors and Medical Referee Board of the Ontario Workmen's Compensation Board.

There is included : low (less than 25 per cent) disability, uncompensated cases, ante-primary of earlier years (or 5 or 5-plus, as they are now rated), and the cases compensated for disability. Disability cases are compensated as partial disability, primary of earlier years, full disability, secondary of earlier years, and fatals where death is due to silicosis. While tuberculosis is not compensated as such, tuberculosis with any degree of silicosis is compensated as full disability.

DEVELOPMENT OF SILICOSIS

Mining at McIntyre Porcupine Mines Ltd. commenced in 1910 when little was known anywhere of the cause and nature of silicosis. Complicated by tuberculosis, silicosis was developed but was largely unheeded because its ravages were largely unknown. It was recognized early that the clouds of dust from dry drilling with piston machines impaired miners' health.

At the first examination in 1925-27, 38 miners, 12 with serious tuberculosis complications, were rated as silicosis cases. A further 84 cases, or an average of 3.4 cases per year, have been rated since for a total of 122 cases. After the early 1925-27 examinations it seemed that with the stopping of the gross dust production of the dry drilling, and with the removal from mining and the pensioning of the active T.B. silicosis cases who were infecting other miners, the production of disabling silicosis would be stopped. Yet despite improvement in ventilation and dust control new cases continued to develop.

The apparent increase in the number of new cases, as in 1941 (10) and 1942 (7), are not due to sudden changes in mine conditions, but rather to changed medical examiners and special examinations of ex-miners on surface.

For protection of all of the miners beyond what medical examinations, ventilation and dust control could give, aluminium therapy, discovered and developed for use at this mine, was commenced in 1944. The mine was thus the first to adopt mass treatment of all miners. There has been some criticism of that procedure on the basis that control groups should have been established. Past experience formed the control.

METHOD OF DISPERSAL

The method of dispersal is by compressed air ejectors into the miners' clothes-changing room. Dispersal is made just prior to the day and night shifts of 450 men each coming to work. The powder, which is so fine and in such minute quantities that it cannot be seen in the air, is breathed by the miners during the approximate 15 minutes clothes-changing time.

The contents of ten 10-gram tins of the McIntyre powder is dispersed into the closed miners' change-room of 100,000 cu. ft. capacity. The powder is approximately 10 to 15 per cent metallic aluminium and 90 to 85 per cent aluminium oxide. Ninety-four per cent is one micron or less in size. The 1952 average suspension of the powder in the change-room is shown in the following table :

Time After Dispersal	*Particles per Cubic Centimeter P.P.C.C.*
10 minutes	42,000
20 „	34,000
30 „	26,000
40 „	21,000
50 „	18,000

In the two years, 1945 and 1946, following the commencement of change-house aluminium therapy for underground miners, there were 13 new cases of silicosis diagnosed, with ten as early silicosis, one as partial disability, and two as full disability.

Only seven new cases have been rated as silicosis since 1946. Of these one ex-employee rated partial disability in 1952 had left mining in 1945 after only a very short period of change-room therapy at that time. None of the six had any of the benefits of aluminium.

In addition to these employees, one miner with nearly 30 years of underground experience has left underground work and is under observation with his case not yet diagnosed as silicosis or tuberculosis. If he is rated a silicosis or tuberculosis case he will be the first of the 900 miners having change-room aluminium therapy who will have been so rated in the six years since 1946.

This experience regarding freedom from tuberculosis bears out medical assurances that aluminium treatments would make the miners less liable to contract tuberculosis by preventing the development of silicosis which would

promote tuberculosis. The few cases of silicosis since 1946 amongst the working miners, and with none of those cases having had the benefits of aluminium therapy, together with the freedom from tuberculosis, is gratifying. Ventilation and dust control has been improved during the same time and while all the credit cannot therefore be ascribed to aluminium, yet the timing appears most significant.

The reduction in new cases is, of course, of prime importance. It is also of great importance to the mines in these days of increased compensation costs. McIntyre has already paid $1,300,000 in silicosis compensation assessments. Compensation paid in 1952 on behalf of McIntyre cases was $125,000, mostly for older cases. With compensation allowances now practically 100 per cent higher than those of ten years ago the cost of compensation at pre-1947 production rates would be almost intolerable to-day.

Rock Wool and its Applications

There is a growing interest in the use of rock wool as a medium of insulation, although its formation by natural processes is a rare occurrence and its synthetic manufacture is limited owing to the necessary composition of the rock treated. In the following article the author outlines the composition and manufacture of rock wool, concluding his remarks with a précis of its properties and applications in industry.

The term "mineral wool" is a general designation for insulating materials in the form of fine glassy fibres. It includes not only rock wool, made from naturally occurring rock, but also slag wool manufactured from the slags produced in smelting metallic ores, and glass wool or glass silk, which is produced from mixtures of sand, lime and alkalies. This article is concerned only with rock wool, which is a material composed of a fluffy mass of fine interlacing fibres of rock glass manufactured from rock of suitable composition.

Rock wool is made by natural processes under conditions so rare that the material is a geological curiosity. It is known as "Pele's Hair" and is formed by the blow-out of steam through fluid basalt lava in the crater of Kilauea, Hawaii. According to the Geological Survey, the first commercial rock wool seems to have been made in 1897 at Alexandria, in the State of Indiana, from a shaly limestone. It was not till 1927, however, that mineral wools in general began to be extensively used in the United States for home insulation, and production in 1928 was only 50,000 tons. Consumption was expanding very rapidly before the war and amounted in 1939 to 139,455 tons of rock wool and 163,135 tons of slag wool. In 1944 the total output of mineral wool of all kinds in the United States was 568,296 s.tons.

MANUFACTURING PRACTICE

In the manufacture of rock wool, rock of suitable composition is melted in a furnace and the molten rock is drawn in a stream to pass in front of a jet of air or dry steam by which the stream is dispersed into a cone of liquid globules. These are drawn out by air resistance to their flight into long fibres which accumulate in a collecting room towards which the jet is directed. The flying particles cool and solidify before being completely transformed to fibre. The small globular beads of glass which remain undrawn are called "shot." The character of the product is influenced by a number of variables such as the chemical composition of the raw material, degree of viscosity of the molten rock, temperature of the melt, diameter of the stream, pressure and temperature of the jet, etc. To produce high quality rock wool to narrow specifications therefore calls for very rigid process control.

Rock wool is composed predominantly of the oxides of calcium and silicon, with smaller but important proportions of the oxides of aluminium, magnesium and iron, and various minor constituents. The presence of oxide of iron or alkalies lowers the melting point of the silicate slag and the presence of iron tends to produce more fluid slag. Despite their favourable effect on the fusibility of the melt, high iron contents are undesirable because they cause the production of a large proportion of shot. Rocks which contain the required constituents in suitable proportions include shaly limestone and dolomite, calcareous and dolomitic shale, and sandstone.

CONSIDERATIONS OF STRENGTH

While many rocks are suitable in composition for the production of rock wool fibre, the range is restricted in practice by the requirement that the rock should be strong enough to support the weight of the charge without packing and so blocking the passage of gases produced by combustion during the manufacturing process. For this reason soft shale, clay and sand cannot be used in cupola furnaces, though they can be dealt with in reverberatory and electric furnaces. Woolrocks which contain silica, lime, magnesia and alumina in suitable proportions for the production of rock wool fibre include shaly limestone and dolomite, calcareous or dolomitic shale, and sandstone. Strata of suitable composition, which are also sufficiently thick and persistent for quarrying, are by no means universally available, and for this reason mixtures of rocks, weighted to yield the desired proportion of the main oxides, are more extensively used than single woolrocks in the United States.

Rock wool has been used in Britain for a number of years, and the growing public interest in this form of insulation is reflected by the publication in 1949 of a second edition of the Geological Survey's Memoir, first published in 1944.*

The authors point out that rocks of the type required for rock wool are not, on the whole, of importance in building or pottery manufacture, or in the refractory industry. Therefore they have rarely been analysed and they have not been the subject of any special investigation. In considering potential sources of supply, it has to be borne in mind that rock wool is a comparatively inexpensive commodity, but it is bulky and therefore costly to transport. Its manufacture consumes on an average a weight of fuel equal to one-third the weight of the raw material. For economic reasons manufacturing plants must therefore be sited, if possible, in close proximity both to sources of fuel and to centres of consumption. Though deposits of woolrock occur in various parts of Britain many of them are not conveniently located, and it may therefore be more economical to use other materials and obtain optimum charge compositions by a suitable admixture of various rocks.

The principal uses of rock wool are in thermal and sound insulation and as a filtering medium for compressed gases, vapours, and corrosive fluids. The material is also used as a packing for acid carboys, as a lining between planking and metal sheathing in ships, and as a constitutent of polishing wheels.

*Special Reports on the Mineral Resources of Great Britain. Vol. IV, "Rock Wool," by E. M. Guppy, B.Sc., and James Phemister, M.A., D.Sc.

It is claimed that as an insulation material rock wool has a number of important advantages over organic wools. It is fire-proof and vermin-proof, its insulating properties are less liable to be affected by a change in weather conditions, and it is relatively inexpensive. It is also non-settling, chemically stable, non-corrosive and water repellant.

Tests carried out by the Department of Scientific and Industrial Research established that a 2 in. thickness of a product marketed under the name of Stillite would keep the temperature of a steel joist down to 140 deg. C. (284 deg. F.) after two hours' exposure in a furnace reaching 1,000 deg. C., giving an adequate safety factor over the temperature (600 deg. C.) at which a joist is likely to collapse.

STILLITE AND ITS PROPERTIES

Stillite is a rock wool made from suitably selected minerals which are mined at Stillington, County Durham. A natural rock is melted in a cupola together with a certain amount of slag for fluxing. It is then treated by a patented process to produce long fibres of great resilience, which are subsequently compressed to a range of densities depending on the particular application under consideration.

The capacity to shed water has an important bearing on an insulant under actual working conditions. The presence of moisture in insulation will reduce its value considerably, since water conducts heat much more than the still air that it replaces. A notable characteristic of Stillite is that it exhibits a high degree of water shedding, the capillary attraction being about 80 per cent less than for cork and some 500 per cent less than for most other fibre insulants.

In a loose-fill insulant, stability is a prime aspect of efficiency and economy, since settlement on any appreciable scale results in the increase of density, while efficiency is further impaired by the formation of an air space above the insulant that offers free passage to heat by convection. Because of its strength and resilience Stillite will not settle either of its own accord or as a result of vibration. In a test conducted at the National Physical Laboratory Stillite and a slag wool were packed in a 60 cu. ft. cavity. With Stillite the specified average bulk density of 12 lb. per cu. ft. was readily obtained and the cavity remained completely filled without evidence of settlement after two weeks. On the other hand, the slag wool could not be packed to a uniform density at all, and up to 50 per cent settlement was found to have occurred at the end of the test period. Experience has shown that with Stillite insulation maximum working efficiency is indefinitely maintained. This results in a substantial saving in installation costs, since no allowance need be made for settlement, and expensive maintenance and replacement operations are avoided.

INSULATING MEDIUM

The loose fluffy wool as blown from the furnace, with some refining to remove coarse fibres and excessive shot, may be used in that form for insulating new buildings. In the insulation of buildings already constructed, a granulated form of the wool is blown by compressed air into spaces between the inner and outer walls. This form is prepared by running the crude wool through granulators or shredders, which break up the long fibres and remove the shot. The building industry also uses mattresses or quilts, which are made by passing the loose wool through rollers and then cutting the resulting blanket to standard sizes by hand or by machine. Blocks of the loose or granulated wool are made in various sizes and thicknesses and of various densities. Short-fibred wool is mixed with other materials to make insulating cement. Granulated wool may also be mixed with suitable binders to form a stiff paste, which is dried in hot air under low pressure to form boards and bricks of various kinds, or the mixture may be moulded into a covering for pipes. Acoustic tiles are moulded products, tinted by suitable colouring matters, which are made from rock wool mixed with starch gel, mineral filler and waterproofing material.

The versatility and adaptability of rock wool are well illustrated by Stillite, which is available for heat, cold and sound insulation in a number of forms including pelleted or felted mineral wool, semi-rigid slabs, preformed sections, flexible felted sections, mattresses and quilts, and insulating cements. The felted wool is suitable for hand-packing cavities of all descriptions, while the pelleted form is recommended for use in all cases where careful hand-packing is impracticable, since in this form the material will find its way into the remote corners of cavities without leaving uninsulated voids. Processed into semi-rigid slabs, Stillite is easily applied to flat and slightly curved surfaces, while for pipe insulation it can be obtained in the form of pre-formed sections so designed that they can be fitted to pipes with the utmost ease and speed by persons with no previous experience. In some applications, however, it may be preferable to use flexible felted sections, which constitute a form of mattress specially constructed to fit pipes and pipe fittings perfectly. These sections can be applied easily in one piece, even where tracer lines and other multiple pipe runs have to be lagged together.

Stillite products possess high insulation efficiency over the whole temperature range from 400 deg. F. to 1,500 deg. F. At 14 deg. F. the thermal conductivity is 0.25, at 500 deg. F. it is 0.36, and at 1,500 deg. F. it is 0.62. The density ranges from about 5 lb. per cu. ft. in the case of felted mineral wool up to 14-18 lb. in the case of semi-rigid slabs of high density quality. These materials are used for thermal insulation in refrigerators, refrigerated holds, lehrs, ovens, cookers, food containers, hot water heaters, storage tanks, buildings, ceilings, wall cavities, etc., or in the acoustic treatment of concert halls, factories, studios and hospitals.

IMPORTANCE OF FILTRATION

Another very important field of applications is presented by filtration. For the filtration of compressed gases, vapours and non-aqueous liquids, rock wool media of suitable types provide virtually 100 per cent efficiency for solid and liquid particles down to 0.1 micron. Maximum efficiency is obtained where the gas velocity does not exceed 0.5 ft./sec., but even at velocities up to 2 ft./sec. efficiencies of over 90 per cent are achieved. Because of their ability to withstand high temperatures, the filter media can be repeatedly heat-sterilized. Their efficiency does not deteriorate, and their useful life depends entirely on the pressure drop beyond the permissible maximum for each installation. Their life depends on conditions, but may be taken as from three to six months under heavy load, after which they can be replaced at low cost.

Special rock wool filters have been developed for producer-gas plants to ensure the removal of all dust particles which would otherwise be carried over to the engine. Others of similar type have proved their efficiency in recovering exhaust steam contaminated with oil, thereby saving substantial quantities of both steam and fuel. In certain very sensitive industrial processes where absolute cleanliness is essential, the required standard of purity can be achieved effectively and cheaply by using rock wools as filter media. For example, the air supply to penicillin incubators is filtered through rock wool in some factories in order to ensure that unwanted bacteria and spores are completely removed from the atmosphere. Another important type of application is the filtration of hot, and often corrosive, gases at temperatures varying between 800 and 1,000 deg. C.

RAND AND O.F.S. SEPTEMBER QUARTERLIES

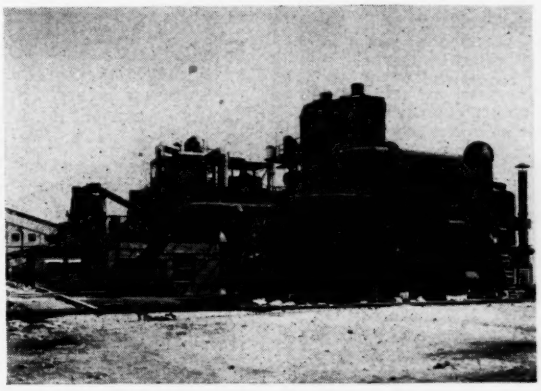
The September quarterly reports of the South African gold mining companies, contain many features of more than usual interest. The tenor is generally good and the bullish rumours regarding developments and uranium profits were confirmed.

O.F.S. DEVELOPING AND PRODUCING MINES

A number of outstanding features presented themselves in the reports of the Orange Free State companies.

The improved results from underground reef work achieved by St. Helena Gold (Union Corporation) in the June quarter, were maintained during the past three months. A slightly lower footage of new ground was opened up but a larger amount of ore was sampled—6,745 against 5,965 ft.—and the pay ratio was 58 against 56 per cent; average value being 9.1 dwt. gold per ton over 35 in.

Several of the Anglo American members achieved particularly good results. A crosscut put out from the haulage being driven from Western Holdings No. 1 shaft towards the common boundary with Free State Geduld cut the reef and all of the 60 ft. developed proved payable with the high value of 2,025 in. dwt. Over a width of 50 in. this would give 1 oz. 12 dwt. per ton with gold at 248s. 3d. per oz., or a revenue of £19 per ton compared with extraction costs at Western Holdings of just under 60s. No reef development was done at Free State Geduld owing to faulting and special precautions against water.



A general view of the sulphuric acid plant at Western Reefs, showing in foreground heat exchangers and converters

President Brand did well with payability of 96 per cent and average value of 1,138 in. dwt. from underground reef development. It gives evidence of surpassing its neighbour, President Steyn, whose in.-dwt. index last quarter was 555 against 419 previously. Payability was also up at 87 against 82 per cent.

Nothing very outstanding showed up in Welkom's September quarterly. A larger footage of 4,460 (4,045) was sampled but pay ratio dipped from 62 to 58 per cent though value went up to 360 compared with 352 in. dwt. Loraine Gold did increased development but pay ratio of the 825 ft. sampled was down at 36 per cent with value of 297 in. dwt.

The two mines under the aegis of Johannesburg Consolidated —Freddies South and Freddies North—gave different results. This latter reported better values of 25.5 dwt. gold per ton over a width of 15 in., equal to 383 in. dwt., while reef payability was slightly higher at 88 against 86 per cent. and a larger footage of 2,355 ft. was sampled. Lower pay ratio and values, on the other hand, were shown by Freddies South mine, where 64 per cent of the footage sampled was payable with an average value of 10 dwt. over 26 in. or 260 in. dwt. as against 290 previously, when payability was up at 73 per cent. No drilling took place on "Geoffries" properties last quarter.

An expansion of underground reef development was reported by Harmony Gold (Central Mining group). 6,143 ft. were developed against 4,606 ft., while footage sampled was 3,090 (against 1,450 ft.) of which 97 (85) per cent proved payable, averaging 15.5 dwt. gold per ton equal to 680. in. dwt.

RAND PRODUCERS RESULTS

The established producers announced some impressive results as will be seen from the following notes.

Central Mining-Rand Mines Group.—The majority of the mines under the aegis of Central Mining did a larger footage of work last quarter and results, for the most part, were better.

Blyvoor's values rose from 571 to 603 in. dwt. although the pay ratio was slightly down at 92 (95) per cent. Footage sampled was 3,195 against 3,860. The mine's gold profits were higher as likewise those from uranium—£94,912 compared with initial earnings in the June quarter of £21,710.

Payability at both Crown Mines and City Deep was better; that of the former rising from 55 to 60 per cent and the latter from 35 to 36 per cent, though value was down at 262 (319) in. dwt. Crown Mines value dropped from 450 to 371 in. dwt. from a smaller footage sampled.

The in.-dwt. index of Consolidated Main Reef went up to 476 against 244, but pay ratio of 38 compared with 46 per cent. Both the pay ratio and value of Durban Deep's 11,980 ft. sampled were down. There was an all-round improvement with East Rand Proprietary. A larger footage of new ground was opened up; footage sampled was higher at 4,650 (3,720), and the pay ratio rose 58 to 67 per cent at 363 (297) in. dwt.

A small amount of work was done by Modder East and of the 2,390 ft. sampled 37 per cent was payable with a value of 180 in. dwt. Although Rose Deep's development and footage sampled was somewhat less, payability rose from 28 to 36 per cent and value from 294 to 388 in. dwt.

Anglo American Corporation.—One of the best Rand gold development quarterly reports for some time was issued by the Anglo American group.

Daggafontein reported that its estimated profit from uranium was £228,000 against £120,000 for the June quarter, which was the first profit obtained by the mine from this source since the plant started up in March last. There was some falling off in payability of the mine's Main Reef Leader, its Kimberley Reef which dropped to 367 against 549 in. dwt.

Western Reefs reported high gold values and payability from the Vaal Reef which is the chief uranium carrier at this mine. Its plant was brought into commission towards the end of last quarter and the first profit will be declared in the December quarter. Of 685 ft. of Vaal reef sampled at this mine last quarter, 96 per cent was payable, averaging 1,125 in. dwt. compared with 97 per cent and 913 in. dwt. in the June quarter.

Poorer payability and values were shown on the Main Reef Leader and the Kimberley of East Daggafontein; the pay ratio of the 5,590 ft. sampled on the Kimberley dropped to 14 per cent against 21 the previous quarter and value to 287 compared with 370 in. dwt.

Consolidated Gold Fields.—The chief feature of the Gold Fields group of quarterlies was the good development results of West Driefontein. The whole of the Carbon Leader reef sampled amounting to 3,335 ft. proved payable averaging 20.9 dwt. gold per ton over 42 in., equal to 878 in. dwt. Value the previous quarter was 932 in. dwt. with 100 per cent payability. Grade of ore milled during the quarter was slightly raised being 14.307 against 14.152 dwt. the previous quarter.

At Doornfontein underground reef development showed lower payability at 62 per cent against 76 in June and 92 per cent in the March quarter. Average value of 9.4 dwt. went against 8 dwt. previously and the in. dwt. came out at 395 compared with 360 in the June three months. Gold production at this Far Western Rand mine is due to start this month.

The other two Far Western mines of the group—Libanon and Venterspost—did not put up an improving record; the latter developed and sampled less ore and although pay ratio was 47 against 42 per cent, value was down at 379 (396) in. dwt. Libanon's payability dropped from 71 to 63 and value from 337 to 295 in. dwt.

Robinson Deep did more development and of the 2,850 ft. sampled, 57 (against 45) per cent was payable value rising to 460 against 352 in. dwt. Simmer and Jack's pay ratio rose from 36 to 38 per cent but value was down at 227 in. dwt.

More development and 8,890 ft. of sampling was done on Sub Nigel, payability coming out at 26 (30) per cent with value up at 378 (350) in. dwt. Vlakfontein's pay ratio was the same as in the previous quarter, 34 per cent but value slightly down at 343 in. dwt. Pay ratio of the 9,405 ft. sampled on Vogelstruisbult was down to 40 (against 48) and value 268 (250) in. dwt.

Union Corporation.—A larger footage of development was done by most members of the Union Corporation and sampling

was generally higher.

East Geduld gave a particularly good account of work, with payability on the Main reef jumping from 65 to 79 per cent although grade only reached the level of the previous quarter—in.-dwt. figures being 281, but this was the best for a number of quarters preceding that of June. The trend of Geduld Proprietary was different. Sampling on the Black reef was less—2,100 ft.—and only 16 per cent against 37 per cent proved payable, but to atone for the disappointment there was an upturn in grade which at 330 compared with 220 in. dwt.

The value of Grootvlei's larger footage sampled—9,335 against 8,990 ft.—was 238 as compared with 221 in. dwt. but pay ratio dropped from 46 to 39 per cent.

With Marievale, there was a drop in pay percentage of both the Main and the Kimberley reefs, though the value of the latter went up to 315 (against 240) in. dwt., and footage sampled was higher, 2,065 ft.

Development work done on Van Dyk was rather lower but footage sampled was higher—5,075 as against 5,620 ft.—and pay ratio came out at 29 compared with 24 per cent, value being 207 compared with 228 in. dwt. The figures include 2,150 ft. of reef sampled in the area being opened up from the new No. 5 shaft in the southern part of the property.

"Johnnies" Group.—There was nothing spectacular in the development results of the Rand producers belonging to Johannesburg Consolidated. Three of the mines—East Champ d'Or, New State Areas and Wit Gold—worked at a loss.

A larger footage of 425 was sampled by East Champ d'Or but pay ratio was lower, 75 per cent with value 187 in. dwt.

Government Areas pay ratio of 51 per cent was the same as in the previous quarter; a slightly larger footage was sampled—5,940 against 5,380—and the value of 245 in. dwt. went against 250 in the June quarter. The small footage of 385 ft. was again sampled by New State Areas though the pay ratio and in.-dwt. index were down at 183 compared with 332. Wit Gold stated that operations were unlikely to be continued beyond November. Work on the uranium project to treat its own and East Champ d'Or slimes is proceeeding.

General Mining.—Net profit from uranium in the case of West Rand Consolidated was the main feature in the company's quarterly: it amounted to £186,509 compared with £157,413 in the June three months. From gold mining, however, profits were slightly lower but the total, with premium and sundry revenue, amounted to £438,014 as against £427,167. A larger development footage was sampled—11,075 ft.—but the pay ratio came down to 30.5 against 32.46 per cent and value to 237 as compared with 283 in. dwt. South Roodepoort sampled 5,135 (4,609) ft., and the pay ratio moved up to 38.9 as against 34 per cent, while value rose to 286 (269) in. dwt.

Anglo Transvaal.—The result of work done during the September quarter on the two O.F.S. members of the Anglo-Transvaal group—Virginia and Merriespruit—indicated progress. At Hartebeestfontein Gold—the Lucas Block mine in the Klerksdorp district—shaft sinking and equipment work was proceeded with together with surface work.

At Rand Leases, the major producing mine of the group, development work showed 46 per cent payability and average values of 267 in. dwt. contrasted with 51 per cent and 257 in. dwt. in the preceding quarter.

The restart of underground reef work at Virginia O.F.S. resulted in an improvement in average values and payability. Including work from the No. 2 shaft, 2,125 ft. were sampled of which 67 per cent was payable averaging 8.59 dwt., equal to 299 in. dwt. In the previous quarter the pay ratio was only 35 per cent and value 196 in. dwt. Work from No. 1 shaft opened up ore giving 85 per cent payability and value 304 in. dwt.

Of the 915 ft. sampled at Merriespruit, 57 per cent was payable of 5.4 dwt. equal to 273 in. dwt. In the previous quarter the pay ratio was 71 per cent and value 334 in. dwt.

Strathmore.—The percentage payability on Stilfontein which has been gradually creeping up showed a satisfactory trend last quarter. Of the 5,095 ft. sampled, pay ratio was 80.5 per cent and values averaged 65.6 dwt. gold per ton over a reef channel width of 6.2 in., equivalent to 407 in. dwt. against 358 in. dwt. the previous quarter. Trial runs of the uranium plant have been carried out and extensions are proceeding for the purpose of extracting uranium from the slimes of neighbouring mines—Ellaton, New Klerksdorp, Babrosco and Afrikander mines.

Underground reef development at Ellaton showed that 91 per cent of the 1,315 ft. sampled was payable with an average value of 16.2 dwt. gold per ton over 29.9 in., equal to 484 in. dwt. against 351 in. dwt. in the June quarter.

Machinery and Equipment

Pilot Machine for Heat Treating Ores

A new range of pilot sintering machines has been announced by the Sintering Machinery Corporation, America, according to a report in *American Metal Market*. The company, designers and builders of Dwight-Lloyd sintering equipment, state that the new machines are for the purpose of the sintering, roasting, agglomerating, calcining and heat treating of ores, concentrates and other materials. The operations take place under research and production conditions.

The range includes larger production machines. They are capable of operation by both down or up draught or in combination, while gases may be recirculated either by pressure or suction for full heat recuperation or gas enrichment. The admission of free air can be controlled to meet the requirements of the various processes.

One unit with hearth area of 2 ft. x 9 ft. is arranged for operation with movable dividers in both lower and upper windboxes. This arrangement provides four windbox section compartments in each. Windbox outlets are provided on both sides of the machine to facilitate gas recirculation arrangements, with blank flanges covering those not in use.

The use of the Rowen windbox between moving pallets and the lower windbox has been extended to provide a positive adjustable pressure seal between the upper windbox and the machined surfaces of the pallet flanges.

It is possible to remove pallet sides, and these can be provided at varying heights to enable investigations to be held—involving various bed depths—under operating conditions. This machine is designed for intermittent or continuous operation.

Coal Extraction on Longwall Faces

A machine claimed to be a significant development in longwall mining practice has been designed by engineers of the Dominion Steel and Coal Corporation. In its operation, the machine is stated to extract and deliver to the loading conveyor 1½ tons of coal in 13 seconds from the longwall face. No explosives are required, nor is manual labour needed.

This information was given to the Empire Club, Toronto, by Mr. L. Forsyth, president of Dosco, who said that his company is introducing mechanized methods to the mining industry of Nova Scotia. Apart from the obvious benefits of increased production, these introductions should restore the industry to good health.

A Coal Preparation Plant

A complete coal preparation plant is being supplied to the National Coal Board (Durham Division) for Horden Colliery, by the General Electric Co. from its Fraser and Chalmers Engineering Works. The contract calls for the supply of the main coal preparation plant, dust collecting plant, tippler house extension and creepers, together with associated civil engineering work, electrical equipment and wiring.

The coal preparation plant will consist of a primary raw coal screen, Chance sand flotation plant, clean coal screening and sizing plant, and general loading equipment including all belt conveyors, loaders, hoists, feed and overflow chutes, water and sand pumps, drive motors and other equipment. The raw coal screen will be some 6 ft. wide x 18 ft. long, and will be capable of handling 210 tons per hour of run-of-mine x 1½ in. coal. Meshes will be fitted for extracting 170 tons per hour of 8 in. x 1½ in. raw coal.

The Chance cone of the Chance sand flotation plant will be 10 ft. in diameter, constructed of ¾ in. M.S. plate, and will be supplied complete with sand inlet box, liners, water nozzles and agitator; the drive will be by means of a double-reduction worm gear box and traction type fluid coupling. The clean coal from the Chance cone will be desanded and dewatered, and then sized by a 7 ft. x 8 ft. 6 in. clean coal screen into plus 3½ in. rd. and minus 3½ in. rd. sizes. A 7 ft. x 8 ft. 6 in. refuse screen will desand and dewater the refuse from the Chance cone.

METALS, MINERALS AND ALLOYS

Political developments this week possess more than a passing interest for the mineral industry. At home the Prime Minister, addressing Parliament at the opening of the session, negatived the idea of any early General Election, and even suggested that the present Parliament might last until the end of its natural term of five years. As general elections are apt to have a very disturbing effect on business, this intimation of the Prime Minister's mind should be welcome. He also expressed the view that a world war had become less likely.

In the United States on Tuesday various Municipal Elections took place besides a Congressional by-election in New Jersey. These elections involved also the governorships of Virginia and New Jersey and the choice of a mayor for New York. In view of the defeat of the Republicans in Wisconsin not long ago, these particular contests were viewed as an important indicator of national sentiment towards the Republicans in general and President Eisenhower in particular. In all four the candidate favoured by the Administration failed to get elected. It is much too early yet to judge the part played by various issues in this result, but it does suggest general dissatisfaction with the Republican record so far. From the angle of the mining interest it seems likely that the policy of restriction on foreign imports of minerals and ores so strongly pressed from certain quarters in the Republican camp and which President Truman's administration appeared to ignore, especially in the Paley Report, may become more clamant. For some time past it has looked as though President Eisenhower was being forced against his own preferences in the direction of the Republican policies which 20 years of Democratic rule might be supposed to have made obsolete. It will now be interesting to see whether he will be encouraged to adhere more closely to his pronouncements made some months ago.

COPPER.—Suspense continues to characterize the copper outlook pending the outcome of the negotiations over the purchase of the great Chilean copper stocks by the United States. In the U.S., as here, there is a scarcity of prompt material due largely to the holding back of these Chilean supplies in the last five months or so. Potentially there is a surplus of supply as indicated in the Copper Institute figures noted in our issue of October 23, in which the Chilean accumulation largely accounted for the big increase in stocks outside the United States at the end of September when they were 236,336 s.tons. There is again no official news available about the negotiations and unofficial conjectures have so frequently proved very wide of the mark that they cannot be relied on. However, it seems to be thought in Washington that the two Governments may sign a pact in the current week. The lines expected seem to be that the U.S. will buy some 100,000 tons of the Chilean stock out of an accumulation variously estimated between 130,000 and 150,000 tons; that they will stockpile this purchase, but that on the other hand Chile will have to make her copper competitive in future, and impose less onerous terms on the United States' companies who are the great producers. Chile, however, seems to want these companies to limit their output. The temporary scarcity of copper in the United States is also due in a minor degree to the strikes which still continue at Chuquicamata, Potrerillos and Noranda. The negotiations between the C.I.O. unions and the brass companies appear to have resulted in agreements with the American Brass Company, but not so far with the Chase Brass Company. But any important strike seems to be unlikely.

The Mitsubishi Metal Mining Company has contracted to purchase copper concentrates from the Atlas Consolidated Mining and Development Corporation of the Philippines for a three year period. The quantity is not disclosed but the Mitsubishi Company is to make a preliminary payment in the form of equipment to develop the mines to a value of $750,000.

The Monopolies Commission in London have announced that they are studying existing arrangements for the production of semi-manufactures of copper and copper-based alloys in their relation to public interest.

LEAD.—Though easing slightly from the quotations reached at the end of last week, the market for prompt metal has retained firm appearance, and the premium over forward looks like continuing for some time. In the United States interest is now centering largely on the hearing by the Tariff Commission which opened on Wednesday with the case presented by the National Lead and Zinc Committee for an increase in the duty on imported metals and concentrates. The chairman of the Committee, Mr. Otto Herries, asked that the duties on lead should be increased by 50 per cent over the rates existing on January 1, 1945. This would mean that lead concentrates would pay 1.8 c. per lb., against the present ¼ c. and bullion 2.55 c., against the present $1\frac{1}{16}$ c. Mr. Herries claimed that excessive imports had thrown thousands of miners out of work and that current duties afforded insufficient protection against devalued currencies and low wage-rates abroad. He claimed that imports last year were more than double what the United States required —though presumably stockpiling absorbed this surplus.

TIN.—The rise in tin prices on the Metal Exchange culminated on Thursday of last week, since when cash has returned to the levels existing before the rise, though three months is somewhat better. In the United States prices have been around 81.50 c. but there was little interest owing to the State elections on Tuesday.

According to the quarterly bulletin of statistics for Malaya the output of tin in the third quarter was 13,880 tons against 13,484 in the second quarter, giving a nine months' total of 41,411 tons against 42,294 in the same period of 1952.

Shipments of Straits tin in October were 5,377 tons. Shipments of concentrates from Indonesia in September in terms of contained tin were 3,662 tons, and for the nine months of this year 23,385 tons against 24,921 tons a year ago. Bolivian exports in August were down at 3,446 tonnes making the eight-month total 24,670 tonnes against 22,701 a year ago.

Bolivian exports in August were down at 2,446 tonnes making the eight-month total 24,670 tonnes against 22,701 a year ago.

The President of the Bolivian Corporación Minera, Sr. Manuel Barrau, speaking at the first anniversary after the nationalization of the Bolivian mining undertaking said in La Paz that production of tin in the Republic had improved by 5 per cent this year. (Normally we do not get production figures, but only exports.) The fall in the tin market had reduced national income by $22,000,000, but notwithstanding Bolivia was making steady headway in her economic recovery. However, she would like an advance of $30,000,000. Bolivia, he said, was now second among the world tin producers; she would soon embark on the second important phase of her mineral programme—that of smelting her own ores at home. This last is another instance of an announcement which may be called "important if true"; the Minister for Mines, Sr. Juan Lechin, was reported at the beginning of September as saying "We have become convinced that the only purchasers are the U.S. and England" (*Mining Journal* September 11, p. 303).

ZINC.—The tone of the zinc market is perhaps a little more optimistic and the backwardation on the London Metal Exchange has been reduced to about £1. The consumption in the United States for the first seven months is given as 606,513 s.tons as against 444,914 s.tons in the same period of last year, but of course the 1952 steel strike makes comparison idle. Stocks at the end of August were estimated at about 108,000 s.tons, so consumers are in no particular necessity to enlarge their inventories.

Yesterday the Tariff Commission was due to open hearings on the case for increased duty on imports. The National Lead and Zinc Committee is asking for the tariff on concentrates to be increased from 0.6 c. to 1.8 c. per lb., and on slab from ¾ c. to 2.1 c.

COBALT.—The U.S. price for metallic cobalt was raised last week by 20 c. to $2.60 per lb. ex stock or store. No change in U.K. prices has been notified as yet.

MANGANESE.—It is reported in London this week that a ship is loading manganese ore at a Black Sea port for conveyance to Britain. Offers of Russian manganese in London were reported in the *Mining Journal* of August 14 last.

TUNGSTEN.—From Wednesday last the Ministry of Materials has lowered its selling price by 25s. per unit to 245s. for wolfram and 230s. for scheelite. The world buying price,

which is purely nominal, may be called 230s. for wolfram and 215s.-225s. for scheelite. In the U.S. the price has been cut to $35-36 per s.ton unit; duty—$8—extra. There have been rather more enquiries in the last day or two, which it is thought in market circles, may possibly lead to some revival of buying.

ZIRCONIUM.—Firth Stirling Inc. of Pittsburg is installing vacuum melting furnaces with an annual capacity of 360,000 lb. to convert zirconium sponge into ingots, and it will melt and roll zirconium and its alloys to meet demands from the chemical, metallurgical and aircraft industries. This follows on the announcement of a new large zirconium plant being planned by the Carborundum Metal Company (*Mining Journal* October 2, p. 394).

Iron and Steel

The iron and steel industry is operating under an almost cloudless sky. Business is booming, outputs rising to almost unprecedented heights, and continuity of operations is assured by the build up of reserve stocks of raw materials.

Least encouraging is the response to the intensive efforts devoted to the export drive. British prices are competitive but many markets abroad are virtually closed to us by restrictions of various kinds. Tariffs, quotas, embargoes, licensing regulations and currency difficulties present an almost insurmountable barrier to overseas trade. Yet in spite of this a few more orders are coming in and this flow will probably be accelerated if the movement for the liberation of trade is successful.

In the meantime the extent of home requirements is profoundly impressive. Big tonnages of plates, joists, sections, sheets, rails, and tubes are on order and nearly all the mills are working to capacity. Only in the bar re-rolling mills is the position unsatisfactory. Foreign business has dwindled almost to vanishing point and home orders are insufficient to keep the mills in regular operation. On the other hand the sheet makers are exceptionally busy and they have recently been called upon to provide substantial tonnages of black sheets for prompt shipment to Argentina. Happily they are well supplied with sheet bars and slabs, chiefly from home sources.

Another welcome development is the quickening of interest in light castings. The improvement is not very pronounced and is probably only in its early stages. But foundry men have been buying high phosphoric iron more freely and parcels of heavy cast iron and machinery scrap are now being sought with some degree of urgency.

Blast furnaces engaged in the production of basic and haematite iron can hardly keep pace with the requirements of the steel plants, and the pressure for heavy steel scrap is intense.

A welcome development is the improvement in the supply of steel plates. Home production has been increased by the enlistment of the aid of the heavy sheet mills which are now turning out substantial tonnages of ¼ in. plate. Imports of plates of foreign manufacture are also coming regularly to hand, and the net result is that if not wholly bridged, the gap between supply and demand has been narrowed very considerably.

The London Metal Market

(From Our Metal Exchange Correspondent)

November 5 passed without any fireworks as far as the copper market was concerned, and the action the Government Broker took a fortnight ago must be regarded as having done much to prevent any unreasonable increase in the backwardation. The general picture is still uncertain, but now that the market has completed the first full cycle it is to be expected that fluctuations will become smoother and the size of the backwardation limited. Continental demand still continues, and, as this is mostly for forward delivery, is largely responsible for the maintenance of the three months' price level.

With the turn of the month the premium for current month lead diminished considerably, but with sustained demand for nearby metal there are still no signs of any stability in the backwardation: demand for metal for future delivery is very spasmodic.

The zinc market has been featureless although the undertone has been very much stronger, and with lessening demand for current month metal the backwardation has reverted to what can be considered a reasonable figure under existing circumstances.

In the U.S. an application has been made to the Tariff Commission for the doubling of the import duty on both lead and zinc in the form of metal and concentrates, on the grounds that imports have been abnormal and have adversely influenced the price to such an extent that domestic producers are threatened with having to operate at a loss or close down.

The Eastern price for tin on Thursday morning was equivalent to £634 per ton c.i.f. Europe. The L.M.E. quotations show a decline from last week which can best be explained by a lessening in demand and the nearer approach of the international conference.

Closing prices and turnovers for the week are given in the following table:

	October 29		November 5	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£630	£632½	£617½	£620
Three months	£612½	£614	£607½	£608
Settlement	£632½		£620	
Week's turnover	380 tons		555 tons	
Lead				
Current month	£97½	£97½	£94	£94¼
Three months	£90¾	£91	£90	£90¼
Week's turnover	6,175 tons		4,375 tons	
Zinc				
Current month	£75½	£76	£75	£75¼
Three months	£72½	£72¾	£74	£74¼
Week's turnover	4,700 tons		5,275 tons	
Copper				
Cash	£237½	£242½	£236	£237
Three months	£223½	£224	£223	£223½
Settlement	£242½		£237	
Week's turnover	4,750 tons		3,175 tons	

NOVEMBER 5 PRICES

COPPER, TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £225 per ton
Crude (70%) .. .. .. £210 per ton
Ore (60% basis) .. .. .. 22s./24s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, 99·5% £150 per ton
Bismuth (min. 4 cwt. lots) 16s. lb.
Cadmium (Empire), 13s. 10d./14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) £280/£295
Osmiridium, £40 oz. nom.
Osmium, £65/£70 oz. nom.
Palladium, £7 15s./£8 10s. oz.
Platinum, £27/£33 5s.
Rhodium, £42 10s. oz.
Ruthenium, £25 oz.
Quicksilver, £61 15s. ex-warehouse
Selenium, 30s. 6d. nom. per lb.
Silver 74d. f.oz. spot and f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 50% 7s. 3d. lb. c.i.f.
40% 6s. 3d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 8s. 0d. per ton c.i.f.
,, ,, (concentrates) £14 8s. 0d. per ton c.i.f.
,, ,, Refractory £14 0s. 0d. per ton c.i.f.
Baluchistan Metallurgical .. £15 19s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) .. .. .. World buying 230s. nom.
,, ,, ... 245s. nom. U.K. Selling
Scheelite .. .. World buying 215s./225s. nom.
,, ... 230s. nom. U.K. Selling
Tungsten Metal Powder (98% Min. W.) .. .. 21s. 6d. nom. per lb. (home)
Ferro-tungsten .. .. .. 18s. 6d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £52 10s. 0d. per ton
Manganese Ore Indian c.i.f. Europe (46% - 48%) .. .. .. 7s. 11d. - 8s. 7d. per unit
Brass Wire .. .. 2s. 5¾d. per lb. basis
Brass Tubes, solid drawn .. 1s. 10d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Markets during the past week were cheerful and busy. Industrial stocks had a sharp rise although a tendency to "boil over" became apparent on Wednesday. Gilt-edged started quietly but later also showed signs of marked improvement.

Mining shares were rather neglected and in some cases definitely flat. Kaffirs presented an unexciting picture, and reports from Johannesburg indicate that the current account may prove a difficult one. Continental buyers were reported to be holding off. Rand Leases were a feature, the sharp rise in the shares being attributed to rumours that the property may eventually become a uranium producer. Durban Deep picked up for the same reason, but authorative quarters do not rate the chances very high. City Deep hardened on the improved October returns. Van Dyk rose after some buying of the shares at their recent low level.

In the O.F.S. market the rich strike at Free State Geduld attracted much interest. A borehole sunk from a crosscut on the 4,700 ft. level gave a value of 1,081 in. dwt. This result came too late to save the options which expired with a nominal quotation before the news was announced. Later the shares again fell away. Harmony improved mainly on reconsidertion of the property's uranium potentialities. St. Helena remained steady on the better October figures but Welkoms fell due to disappointment with the returns from this property.

In the West African section Bibianis were cautiously marked up on the much improved development results from the bottom of the mine.

West Australians also showed a firmer trend. North Kalgurli succeeded in reducing its operating costs. The immediate outlook for this field is clouded by two uncertainties. Transport costs on the local railways have again been sharply advanced, and rumours of a possible devaluation of the Australian £ against sterling are again being canvassed.

Coppers recovered from their momentary setback following recent dividend announcements. It is quite clear that the past year has been most satisfactory, and the present price of the metal has raised hopes of another good year to come. While it would be unrealistic to expect the present price levels to be maintained indefinitely, they have, in fact, been sustained much longer than many people expected. There was also other bullish news for Northern Rhodesian producers. Extra coal supplies have been arranged from South African collieries. These will be shipped 3,000 miles by sea and supplied over the Belgian Congo Railway system. The companies are also producing a scheme for supplying long service pensions for African employees, which it is hoped will help to stabilize the labour situation. Rhodesian Katanga jumped on renewed hopes of further borehole results in the near future.

Tin shares remained inactive but exceptionally Amalgamated Tin Mines of Nigeria again improved on columbite production estimates. Beralts fell sharply. Prices for tungsten ore have been cut by another 25s. per unit in the U.K. Many marginal wolfram mines which opened up in the Korean boom are now closing down. The U.K. Ministry of Materials is reported to have large stocks on hand and to be making few purchases.

The steady price of lead and improved level of zinc encouraged shares in this group. The chairman of Broken Hill South expressed the view that the long term outlook for lead/zinc was sound due to increased use and the limited sources of supply in the world. He warned, however, that consumers might develop substitutes if present very high price levels persisted for too long. Rhodesia Broken Hill remained unchanged due to a labour dispute on the property.

The demand for manganese and asbestos shares continued and good gains were recorded for the leading companies. Rhodesia Monteleo again fell on news that the closure of the property was due to the low price offered for their fibres.

Renewed interest was shown in the Canadian market and several issues record satisfactory gains. Hollinger went ahead on the latest news from Ungava. Inco declined following the cut in the extra final dividend. The company is paying $2.35 for the year against $2.60 for the two previous years.

	Price Nov. 4	+ or — on week
FINANCE		
African & European	2	.....
Anglo American Corpn.	5 7/16	—⅛
Anglo-French	17/6	.....
Anglo Transvaal Consol.	20/-	.....
Central Mining (£1 shrs.)	26/6	—9d
Consolidated Goldfields	48/6	—3d
Consol. Mines Selection	23/9	.....
East Rand Consols	2/7½	—3d
General Mining	3 1/16	—⅛
H.E. Prop	36/3	.....
Henderson's Transvaal	7/-	.....
Johnnies	50/-	—3d
Rand Mines	3⅜	.....
Rand Selection	29/4½	—1/3
Strathmore Consol.	30/-	—7½d
Union Corp. (2/6 units)	25/-	—1/-
Vereeniging Estates	3⅜	+ 1/16
Writs	30/6	—2/-
West Wits	40/-	—7½d
RAND GOLD		
Blyvoors	38/3	—9d
Brakpan	9/6	—6d
City Deep	15/6	+6d
Consol. Main Reef	17/6	.....
Crown	33/1½	.....
Daggas	3 11/16	.....
Doornfontein	21/6	—6d
Durban Deep	36/3	+1/3
E. Daggas	13/3	—4½d
E. Geduld .. (4/- units)	29/4½	—7½d
E. Rand Props	2 1/16	—1/16
Geduld	4	.....
Govt. Areas	11/9	.....
Grootvlei	21/9	—3d
Libanon	8/9	—1½d
Luipaards Vlei	21/9	—9d
Marievale	16/9	—3d
Modderfontein East	17/6	.....
New Kleinfontein	17/6	—7½d
New Pioneer	16/-	—9d
Randfontein	46/-	—1/-
Robinson Deep	10/6	—3d
Rose Deep	12/6	.....
Simmer & Jack	4/6	.....
S.A. Lands	18/9	—1/-
Springs	4/-	—1½d
Stilfontein	25/6	—3d
Sub Nigel	39/4½	—7½d
Van Dyk	4/6	+6d
Venterspost	12/9	—6d
Vlakfontein	12/6	—6d
Vogelstruisbult	31/3	—9d
West Driefontein	6½	—⅛
W. Rand Consolidated	2½	—⅛
Western Reefs	2⅜	—1/16
O.F.S.		
Freddies	8/6	—1½d
Freddies N.	8/6	—1½d
Freddies S.	7/6	—1½d
F. S. Geduld	2 1/16	—1/16
Geoffries	12/9	—9d
Harmony	23/6	+6d
Loraine	6/6	—6d
Lydenburg Estates	11/6	—3d
Merriespruit	7/6	—3d
Middle Wits	13/3	—9d
Ofsits	32/9	—1/-
President Brand	27/9	.....
President Steyn	20/9	—7½d
St. Helena	13/3	.....
Virginia Ord.	11/-	—6d
Welkom	14/9	—1/3
Western Holdings	3 3/16	—⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/8½	+¼d
Ariston	5/10½	.....
Ashanti	20/3	+1½d
Bibiani	5/3	+3d
Bremang	2/1½	.....
G.C. Main Reef	3/4½	.....
G.C. Selection Trust	6/-	.....
Konongo	2/1½	—1½d
Lyndhurst Deep	11d	—1d
Marlu	1/3	.....
Taquah & Abosso	2/9	—3d
AUSTRALIAN GOLD		
Boulder Perseverance	2/6	.....
Gold Mines of Kalgoorlie	13/3	+3d
Great Boulder Prop.	9/6XD	+3d
Lake View and Star	14/6	—9d
Mount Morgan	17/9	.....
North Kalgurli	6/6	+6d
Sons of Gwalia	5/9	+3d
South Kalgurli	6/9	.....
Western Mining	11/10½	.....
MISCELLANEOUS GOLD		
Cam and Motor	9/4½	—1½d
Champion Reef	4/9	.....
Falcon Mines	7/1½	+1½d
Globe & Phoenix	22/6	—6d
G.F. Rhodesian	5/-	.....
London & Rhodesian	4/9	—1½d
Motapa	1/9	.....
Mysore	4/-	+6d
Nundydroog	5/9	+1½d
Ooregum	4/1½	.....
Oroville	11/4½	—1½d
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	23/-	.....
Zams	30/9	+3d
DIAMONDS & PLATINUM		
Anglo American Inv.	3 3/32	—1/32
Casts	21/6	—6d
Cons. Diam. of S.W.A.	4½	.....
De Beers Defd. Bearer	63/6	—3d
De Beers Pfd. Bearer	16	+¼
Pots Platinum	8/3	—6d
Watervaal	13/9	—3d
COPPER		
Chartered	50/9XD	—2/3
Esperanza	6/6	—1½d
Indian Copper	3/10½	.....
Messina	3 11/16	—⅛
Nchanga	6 5/16	.....
Rhod. Anglo-American	49/9	+3d
Rhod. Katanga	15/4½	+1/7½
Rhodesian Selection	14/7½XD	+1½d
Rhokana	18¼	+¼
Rio Tinto	20¼	.....
Roan Antelope	13/7½XD	—6d
Selection Trust	32/9	—1/-
Tanks	59/3	+1/9
Tharsis Sulphur Br.	42/6	.....
TIN (Eastern)		
Ayer Hitam	23/1½	.....
Bangrin	8/-	.....
Gopeng	7/6	—1½d
Hongkong	5/6	.....
Ipoh	13/9XD	+1/3
Kamunting	7/9XD	.....
Kepong Dredging	4/-	.....
Kinta Tin Mines	10/-	.....
Malayan Dredging	25/6	.....
Pahang	13/1½	—1½d
Pengkalen	8/-	.....
Petaling	7/6	—3d
Rambutan	10/6	+3d
Siamese Tin	8/-	—3d
Southern Kinta	13/-	.....
S. Malayan	24/3	+3d
S. Tronoh	7/9	.....
Sungei Kinta	10/-	.....
Tekka Taiping	4/-	.....
Tronoh	21/9	—3d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	10/9	+6d
Beralt Tin	20/6	—3/3
Bisichi	4/-	.....
British Tin Inv.	12/3	—1½d
Ex-Lands Nigeria	3/6	.....
TIN (Nigerian and Miscellaneous) contd.		
Geevor Tin	9/9	.....
Gold & Base Metal	3/3	.....
Jantar Nigeria	8/6	+1½d
Jos Tin Area	11/1½	—3d
Kaduna Prospectors	2/4½	.....
Kaduna Syndicate	2/6	+1½d
London Tin	5/3	—3d
United Tin	2/10½	+3d
SILVER, LEAD, ZINC		
Broken Hill South	43/-XD	—1½d
Burma Mines	1/4½	.....
Consol. Zinc	25/6	+1/3
Lake George	9/-	—3d
Mount Isa	31/3	+3d
New Broken Hill	23/3	+3d
North Broken Hill	2 1/16	+1/16
Rhodesian Broken Hill	10/7½	.....
San Francisco Mines	17/3	.....
Uruwira	2/6	.....
MISCELLANEOUS		
BASE METALS & COAL		
Amal. Collieries of S.A.	43/-	.....
Associated Manganese	52/6	+1/6
Cape Asbestos	22/7½	+1/-
C.P. Manganese	53/3	+3/3
Consol. Murchison	19/9	—1/3
Mashaba	3d	—1½d
Natal Navigation	3½	.....
Rhod. Monteleo	1/3	—1/3
Turner & Newall	65/-	+6/-
Wankie	12/1½	+1½d
Witbank Colliery	3 1/32	.....
CANADIAN MINES		
Dome	$29½	.....
Hollinger	$25½	+1½
Hudson Bay Mining	$77	+2
International Nickel	$71⅛	—⅛
Mining Corpn. of Canada	£3¾	+¼
Noranda	$120	—1¼
Quemont	£6⅜	+⅜
Yukon	3/9	.....
OIL		
Anglo-Iranian	8	+7/32
Apex	44/-	+2/9
Attock	36/6	+3d
Burmah	56/6	+10½d
Canadian Eagle	29/3	.....
Mexican Eagle	23/-	+1½d
Shell (bearer)	4 3/32	+5/32
Trinidad Leasehold	33/6	+5/-
T.P.D.	24/-	+6d
Ultramar	28/6	+1/10½

COMPANY NEWS AND VIEWS

Kamunting Maintains Dividend at 40 Per Cent

With the recommendation of a final dividend payment of 27½ per cent, Kamunting Tin Dredging will be paying a total of 40 per cent for the year ended March 31 last, the same as was paid in the preceding year. The total distribution comes from a smaller working profit which at £600,815 compares with £780,922 in the preceding year. Nevertheless, tax liabilities were appreciably lighter, £345,000 against £520,000, the allocation to contingencies reserve was £25,000 less at £75,000, and after providing £33,000 (nil) for additional depreciation, the net profit for the year was £147,815 against £140,379. The total dividend distribution required £145,035 (£140,438) and the amount carried forward was slightly higher at £84,944 compared with £82,164 brought in.

The foregoing figures reflect another satisfactory year's operations and total production of tin concentrates amounted to 1,979 tons, a decrease of 503 tons on that of the preceding year. The decline in output was due mainly to the company's No. 2 dredge having exhausted its payable ground in February 1952, and to a decline of 76 tons in the output of its No. 1 dredge. Both of these dredges have been working the payable areas on the Pangna River Leases, which have now been exhausted, and the dredges are being dismantled prior to their reconstruction and subsequent operation on the company's new property at Bangtoe. This operation will require an expenditure of about £570,000 and it will be cheering news to shareholders to know that the whole of this amount can be financed from the cash balances accumulated from profits of past years.

The outlook for the current year is not too bright. For the first six months production of tin concentrates totalled 648 tons which represents a big drop from the 1,114 tons produced in the corresponding period of the year under review. This decline is due to the company's two Pangna dredges being out of commission until they resume production in the Bangtoe area, and to its No. 1 dredge on the Kamunting property having dredged all available land in its selected area, resulting in its shutting down on April 10 last. In this connection, Mr. Jack Addinsell, chairman, pointed out in his statement that the No. 1 dredge on the Kamunting property has been in commission since 1915 and as it is a shallow-digging machine it is doubtful if a suitable area can be found for it—meanwhile it is placed on a care and maintenance basis.

To these difficulties it is necessary to add that the tin price since the end of the company's financial year has fallen drastically and tin proceeds, even if it were possible to maintain production at last year's levels, could hardly be comparable to that obtained during the year under review.

Meeting, London, November 24.

Perak River Re-enters Dividend List

A dividend of five per cent and a bonus of one per cent has been recommended by The Perak River Hydro-Electric Power Company for the year ended July 31 last.

Year to July 31	*Power Sales*	*Taxation*	*Net Profit*	*Dividend*	*To Reserves*	*Carry Forward*
	£	£	£	%	£	£
1953	1,385,190	387,500	159,117	6*	65,000†	106,176
1952	1,266,709	381,839	132,777	Nil	75,000	103,403

* Comprises dividend of 5 per cent and bonus of 1 per cent.
† Allocated as between general reserve £15,000 (1952 - £75,000) and contingency reserve £50,000 (1952 - nil).

The company, whose main customers are the Malayan tin producers, re-entered the list of dividend payers with its latest distribution, which is the first payment on the £1,750,000 ordinary issued capital since the same payment was made in respect of 1940-41. However, it does not come as a complete surprise as the way was cleared for the resumption of ordinary payments last year when eight years' arrears were paid off on the 1,250,000 five per cent cumulative preference shares of £1 each.

The balance sheet shows a sound financial position, current assets as at July 31 last were recorded at £1,544,532 (£1,536,819), and current liabilities at £172,769 (£396,575).

Mr. Hugh G. Balfour is chairman. Meeting, London, November 26.

Now It's South Bukeru!

A circular sent to South Bukeru Areas shareholders this week gives preliminary notice of the calling of an extraordinary general meeting, requisitioned by certain shareholders for the purpose of removing the present Board and electing certain of the requisitionists in their place. At the last annual general meeting of the company, which was held as recently as September 24, nothing emerged to suggest that there was any dissatisfaction with the present constitution of the Board, and shareholders must therefore be wondering what can have occurred in the interval to warrant such extreme action.

As the present directors of South Bukeru are the same as those of Naraguta Tin, shareholders might be well advised to study reports of the recent unsuccessful manoeuvre to replace two of the directors of the latter company (see this column October 9, 16, 23, 30, and page 512 of October 30). Although as yet we have no information as to the identity of the requisitionists, we would not be surprised to find that they represent substantially the same interests as in the case of Naraguta Tin. However, comment must await more detailed information.

"Rhomonte" Explains Shutdown

The Board of Rhodesian Monteleo Asbestos have now issued a further notice to shareholders explaining why they have found it necessary to place their mine on a caretaking basis. Substantially, the explanation tallies with what we suggested (in this column on October 9) the situation might prove to be, namely that during the third quarter of this year it became impossible to dispose of the mine's output, even at the substantially reduced market prices prevailing. Owing to some five months delay in the mine reaching the production stage, which had originally been scheduled for September, 1952, coupled with lack of sales revenue, the company now has outstanding temporary loans of £261,500 as at September 30 last. We have still no information as to the extent to which Russian sales in Europe are keeping South Africa out of this market, but, aside from this factor, a recrudescence of dollar shortage would appear to be the best short term hope of this mine becoming able to compete with the Canadian producers, although it is one which on balance is unlikely to appeal to shareholders.

Mr. K. A. E. Moore Gives a 3D Picture of T.P.D.

Mr. Kenneth A. E. Moore, chairman of Trinidad Petroleum Development Company, whose results for the year ended July 31 last were discussed in this column in our issue of October 23, gives an interesting historical review of the company's progress in his annual statement to shareholders which is reported in this issue on page 544. Mr. Moore begins his review with the sound assumption that a balance sheet lacks perspective unless considered against a background of the accounts of earlier years and some reasonable assessment of the prospects in the years ahead. Thus his objective in his statement is to give a fair and balanced view to the company's affairs with a preference to the broader considerations—"a sort of three dimensional picture." He achieves his objective admirably.

Harmony's Envisaged Uranium Profits. — Harmony Gold Mining in the full prospectus published this week formalizes its offer to shareholders (and to two other companies with holdings in Harmony) of 2,040,000 5s. shares at 20s. and £2,266,667 in 6 Per Cent Registered Unsecured Convertible Notes at par in the ratio of 3 new shares for every 20 held and the notes on the basis of one £1 note for every 6 held. Details of this offer were announced in this column in our issue of October 23. However, the prospectus also adds the important announcement that uranium values on the property have been encouraging, and in the light of ore disclosures to date it is estimated that profits from the uranium plant will be of the order of roughly one-third of the working profits from gold.

The prospectus also makes it clear what while the original endeavour was to bring into operation the uranium plant together with the first unit of the gold plant, this will not now be the case and it is expected that the gold plant will come into operation in June, 1954, and the uranium plant several months later.

Wit Extensions Offers Shareholders Shares in Jeannette.—Wit Extensions in a circular to their shareholders announce that to all those registered on November 13 will be offered the right until December 18 to purchase from Wit Extensions shares in Jeannette Gold Mines in the ratio of six shares of 10s. each in Jeannette for every 5 shares held in Wit Extensions, fractions being ignored. Applications to purchase a lesser or greater number of shares will be entertained.

Low Tin Price puts Kampong on Care and Maintenance Basis.—Kampong Lanjut Tin Dredging has announced that the severe fall in the tin price has rendered tin winning operations uneconomic and rather than maintain production at a loss the mine and plant will be placed on a care and maintenance basis and expenditure reduced to a minimum. A close-down period of at least 18 months, the announcement states, must be expected.

SOUTH AFRICAN COAL ESTATES (WITBANK)

(Incorporated in the Union of South Africa)

IMPROVED TRADING RESULTS

The thirty-third annual general meeting of shareholders in South African Coal Estates, Ltd., will be held in Johannesburg on Thursday, November 26.

The following is an extract from the statement by the Chairman, **Mr. T. Coulter,** dated September 11, 1953, circulated with the annual report and accounts for the year ended June 30, 1953:—

The profit derived from coal-mining operations during the year ended June 30, 1953, after deduction of administration expenses, was £297,334, an increase of £35,508 compared with the figure for the previous year. Sundry revenue, dividends and interest totalled £10,456.

The net profit was £302,938 which amount, together with the balance of unappropriated profit of £87,327, made a total of £390,265 available for appropriation. Provision for taxation absorbed £80,500 and dividends, maintained at the rate of 4s. per share, called for the payment of £200,000. Directors' additional remuneration of £4,000, additional appropriations for capital expenditure of £3,904 and expenses incurred in reclaiming equipment from Landau No. 2 amounting to £981, totalled £8,885, leaving £100,880 to be carried to the balance-sheet. The latter requires little comment. Expenditure on fixed assets and standard stock of stores totalled £1,663,264. Current assets show a satisfactory margin over liabilities.

OPERATIONS

The sales output for the year under review was 1,660,691 tons, representing an increase of 1,647 tons compared with the previous year. The following tabulation gives a comparison of the coal sales from the three mines for the past three years:—

	Year ended 30.6.51 Tons	Year ended 30.6.52 Tons	Year ended 30.6.53 Tons
Navigation ...	683,830	497,675	511,743
Landau 2	251,519	Nil	Nil
Landau 3	1,004,464	1,161,369	1,148,948
Totals ...	1,939,813	1,659,044	1,660,691

Coal was disposed of from the two mines in the following manner:—

	Navigation	Landau 3
Transvaal Coal Owners Association (1923) (Pty.) Ltd. ...	—	1,148,948
South African Iron and Steel Industrial Corporation Limited	511,743	—
Totals	511,743	1,148,948

Coal sold through the Transvaal Coal Owners Association during the year amounted to 1,148,948 tons, representing a decrease of 12,421 tons in comparison with the previous year.

Hauling time lost at the two mines was chiefly due to a shortage, or late arrival, of railway trucks as indicated below:—

	Shortage of rly. trucks Hours lost	Other causes Hours lost	Total stoppages Hours
Navigation	62¾	68	130¾
Landau 3	200¾	25¼	226
	263½	93¼	356¼

Navigation Mine. The development position remained satisfactory, coal of normal thickness and value having been opened up. The requirements of Iscor continue to be met with equal proportions of No. 5 and No. 2 seams. The coal preparation plant has generally operated satisfactorily during the year.

Landau No. 3. The mine has continued to operate on double shift, but the acute shortage and erratic supply of railway trucks has again adversely affected the output. The alterations and additions to the crushing plant were completed during the early part of the year. This plant is now capable of crushing the entire output of round coal.

GENERAL

During the year arrangements were made to lease from Amalgamated Collieries of South Africa, Ltd., the houses comprising the colliery village at Old Schoongezicht Colliery. This has relieved the housing accommodation problem. All surface and underground machinery was maintained in good order and operated satisfactorily.

AMALGAMATED ANTHRACITE COLLIERIES

QUESTION OF REORGANIZATION

The twenty-ninth annual general meeting of Amalgamated Anthracite Collieries Limited, was held on October 29 in London, **Mr. John Waddell,** the chairman, presiding.

The following is an extract from his circulated statement for the year ended December 31, 1952:—

Within the last month or so we have practically reached agreeement with the Coal Board on all outstanding values and the final position is likely to be a more or less permanent balance due by the parent company to the British Anthracite Company, Ltd., of some £500,000 to £600,000.

Our operating subsidiary, the British Anthracite Company, Ltd., has again had, considering all the difficulties, a very successful year. The trading profit comes out at some £563,000 compared with £602,000.

PROPOSED DEBENTURE ISSUE

You will see from the consolidated balance sheets of The British Anthracite Company, Ltd., that the amounts represented in stocks and book debts and liquid assets have increased by nearly £1,000,000 since December 31, 1950, and although there has been some corresponding increase in creditors we are still urgently in need of half-a-million at least of added liquid money. This is being negotiated and we hope within a matter of a month or so, subject to Capital Issues Committee consent, to have arrangements completed.

We are proposing to raise the money by a long-term debenture issued by the parent company, Amalgamated Anthracite Collieries, Ltd., backed by the operating subsidiary, The British Anthracite Company, Ltd. This loan would be used to repay substantially the amount due from A.A.C. to B.A. Company.

When these arrangements are completed within the next few months and if the profits for 1953 are reasonably maintained, then it should be possible to pay something beyond the Cumulative Preference dividend in respect of 1953.

FUTURE DIVIDENDS

We have, as I see it, three courses open to us as regards dividends, but they depend on the attitude of both classes of stockholders. These three courses are as follows:—

We can leave the capital deficit standing in the balance sheet ad infinitum and distribute whatever profits are available.

The second alternative is the direct opposite of this, whereby the equity stockholders might feel that their proportion of any such distribution would be so small that it would be better to have nothing distributed but to use all available profits ploughed back to make good their capital deficit.

There is some justification for such a policy because it would conserve entirely for the benefit of the Ordinary stockholders what would have been paid out in participation to the Preference stockholders together with the distributed profits tax relating thereto, as well as any Ordinary dividends contemplated. To achieve such a policy the Ordinary stockholders would merely have to vote against any dividends in excess of the Cumulative Preference dividend.

POSSIBLE COMPROMISE

The third alternative is a compromise whereby the capital might be brought more in line with the value of the assets, which would be a good feature, and where, by a rearrangement of the rights between the participating stock and the equity stock, it might enable both parties to receive some extra dividend at an early date. Thus, the Preference stockholders would actually collect some of their participation which otherwise might be blocked, and the Ordinary stockholders might collect in cash some of the profits which otherwise they would have to plough back into the business for an indefinite period.

I hope the foregoing has clearly set out the issue between the Preference and equity stockholders, and in view of the possible conflict of interests I would say that your Board feel that a reorganization scheme under the third alternative above is the most desirable course to follow.

If it appears to be the general wish of our members that such a reorganization scheme should be considered your Board will undertake to place one before the members within three months. If such a scheme were then adopted it would remove any conflict between the classes of stockholders and any further obstacles to making whatever distribution would be justified by the accounts in respect of the year 1953.

At the meeting, in response to an enquiry from the Chairman, stockholders unanimously voted in favour of the suggestion to reorganize the capital of the company.

The report was adopted.

TRINIDAD PETROLEUM DEVELOPMENT COMPANY

A SUCCESSFUL YEAR

The annual general meeting of Trinidad Petroleum Development Company, Ltd., was held on October 29 at the Abercorn Rooms, Bishopsgate, London, E.C.

Mr. Kenneth A. E. Moore, F.C.A., the chairman, who presided, said:—

It has been said, with considerable truth, that every balance-sheet suffers from the defect that, by its very nature, it can be no more than a snapshot of the position of a business at a certain date—a "still" of a moving object, since, in reality, every business is on the move, either uphill or downhill.

Thus, a balance-sheet lacks perspective unless considered against the background of the accounts of earlier years, in the light of the story behind the figures and some reasonable assessment of its prospects in the years that lie ahead.

It will be my object to-day to give you a fair and balanced view of our affairs by reference, among other things, to these broader considerations—a sort of 3-dimensional picture.

THE YEAR'S RESULTS

But, first of all, let us look at the results of the past year:—

The production of crude oil was 3,424,409 barrels—the highest figure for 12 years. Its sale produced a profit of £716,515 after charging all outgoings except taxation. These outgoings included over £750,000 spent on oil wells and development account, which broadly represents the cost of the 44 wells drilled during the year, and over £300,000 for depreciation of plant, machinery, casing in wells, etc.

Of the profit of £716,515 taxation absorbs £425,172, leaving £291,343, of which £205,694 is absorbed by the dividends paid or proposed, and £85,649 is left in the business mainly in the form of an addition of £75,000 to general reserves.

The capital employed is £3,148,604 as shown by the balance-sheet.

This has been built up as follows:—	£
Cash subscribed by the public for Ordinary stock in 1937	500,000
Cash subscribed by the public for Preference shares in 1940 and 1949	725,600
	£1,225,600
Ordinary stock held by British Controlled Oilfields since 1937	500,000
	£1,725,600
Undistributed profits ploughed in over the life of the company	875,879
Reserve for future taxation and contingencies	547,125
	£3,148,604
This is represented by fixed assets—plant and buildings, properties, etc., at the written down value of	2,402,050
Plus net current assets	746,554
	£3,148,604

In the light of the satisfactory outcome of the year's working and of the reasonably sound financial position, your directors have felt able to recommend an increase in the final dividend, making the total distribution for the year up to 18½ per cent. free of tax, on the Ordinary stock. The increase in dividend would not have been feasible but for the more favourable terms of the new long-term oil-sale contract entered into with U.B.O.T. as from July 1, 1952.

HISTORICAL REVIEW

And now, to give these figures perspective, let us turn back the pages of history. You may not know it but your company owes its origin to a famous British firm of contractors who were commissioned, many years ago, to build railways in Mexico. In the course of this work they accidentally discovered the Mexican oilfields, and, no doubt, became the richer as the result of it. A few years later it was represented to them that there was oil to be found in Trinidad, so they sent a team there to prospect and explore.

The early results were encouraging, but baffling owing to the confused and distorted geological conditions met with in Trinidad. They persevered, however, for a number of years and in 1918 founded the Trinidad Petroleum Development Company, Ltd., to carry their venture a stage further.

In all they spent and lost a million pounds more or less in the unsuccessful attempt to establish production on a commercial basis. By 1924, after many disappointments, they had come to the conclusion that the game was not worth the candle and sold their shares in T.P.D. for the proverbial song—the purchaser was British Controlled Oilfields.

Thereafter, T.P.D., owned and financed for the time being by B.C.O., continued the struggle to reach profitable commercial production, but although a measure of success was achieved, it was not until about 1935 or later that there seemed to be real hope of turning the corner.

By that time B.C.O. was not prepared to risk further money in Trinidad and accordingly a scheme was prepared under which the capital of T.P.D. was to be reorganized and T.P.D. to become an independent public company. The reorganized capital was to consist of one million Ordinary shares of £1 each, of which B.C.O. was to retain 500,000 shares and the remaining 500,000 were to be offered to the public for cash at par by public prospectus.

It was at this stage that Lord Rothes, Mr. Jacks, and I were approached on the matter and were invited to join the Board of the reorganized company, with myself as its chairman, the other directors to be Sir Goronwy Owen, with Mr. Tweed and Mr. Dalley as joint managing directors.

To cut a long story short, the prospectus was duly issued in January, 1937, and was over-subscribed. In it production was estimated at 1,500,000 barrels and profits at £90,000. The company then had oil rights over some 24,000 acres on the mainland of Trinidad.

TURNING POINT IN COMPANY'S AFFAIRS

This was the turning point in the company's affairs and, since then, it has been conspicuously successful—the new money provided by the public, the new effort and the new management put the company very much on its feet and, indeed, in the 16 years ended July 31, 1953, production has averaged 3,006,514 barrels per annum and profits £421,360 per annum. The comparative figures for the year just passed, you will remember, were production 3,424,409 barrels and profits £716,515, and to-day we hold oil rights over some 74,000 acres on the mainland of Trinidad.

In the meantime, as the developments were so considerable, extra capital was required and this was found wholly by the public in the form of 700,000 Preference shares of £1 each issued at a premium.

PROGRESS IN TRINIDAD

In Trinidad, as our affairs have developed and prospered, we have built roads, workshops and power stations, houses in model villages and camps, and have provided sanitation, drainage and water, gas and electricity supplies, and many amenities, such as clubs, playing fields, etc. We have also provided a medical clinic and medical services for our employees and their families, and, in the areas in which we operate, have almost stamped out the scourge of malaria and greatly reduced the incidence of other tropical diseases.

Finally, we have provided technical and other educational facilities, giving opportunities to local boys, including scholarships to British universities.

We have provided a great deal of useful employment, have looked after our employees and their families and have enjoyed excellent relations with them and with their union. In short, we have done a thoroughly good job for the community of Trinidad and I am delighted too that, in the process, our shareholders have had a good return on the savings which they had the courage to entrust to what is, after all, a hazardous enterprise. The capital value of their investment has also greatly increased.

As oil companies go we are, of course, very small fry and Trinidad is not a large island, but there is the advantage that, in such a case, the benefits of our enterprise are there for all to see and I make no apology for drawing attention to them.

The larger oil companies, I need hardly say, bring similar, but correspondingly greater benefits wherever they operate successfully in the four corners of the earth, often in hitherto undeveloped territory. It is strange that their great contribution to the welfare of the local communities and to mankind in general so often passes unrecognized and unappreciated.

THE FUTURE

But, to return to our domestic affairs, and to look ahead a little, the fact that during the last 16 years we have taken nearly 50,000,000 barrels of oil out of the ground means that our search for oil has to go on over wider areas and ever deeper. In the curious and mainly lenticular geological formation in Trinidad this involves persistent and intensive drilling year after year, both in proved and unproved areas, and we are fortunate in that we still have a large area—more than half the total—as yet untested by the drill. This is a laborious and expensive but nevertheless inescapable task if production is to be maintained and further reserves are to be discovered.

You will remember that during the war we were required, in the national interest, to confine our drilling to more or less proved areas so as to get the maximum of oil for the minimum

of steel and equipment. As a result, after reaching a peak production of 3,660,255 barrels in 1941, production began to tail off and since 1948, when we were able to get new and heavier equipment, we have had to devote a significant part of our efforts to making good this falling off by reaching out to new ground or going deeper. Hence the heavy expenditure in recent years on what we call exploratory and semi-exploratory drilling to distinguish it from bread-and-butter drilling. This has enabled us to increase production from a post-war low of 2,662,170 barrels to nearly 3,500,000 barrels. It has brought no spectacular success, but it has increased our knowledge of potential reserves and has yielded vital geological information.

During the past year the total expenditure on drilling was £774,000 exclusive of the cost of casing. Rather more than one-third was on exploratory and semi-exploratory wells, principally in the Moruga area. As the result of information gained in the course of drilling in this area and of seismic surveys recently completed there, our geologists have high hopes that the Moruga district will provide important additions to our reserves. In the meantime we are getting modest production from certain of the wells already drilled in this area.

MARINE AREAS

You will remember that, on a previous occasion, I mentioned that the Government of Trinidad and Tobago had indicated its intention of granting marine oil mining licences to this and to certain other oil companies. The grant in our case covers some 350 square miles situated off the south and west coasts of Trinidad.

Negotiations have been proceeding for some time past with Trinidad Northern Areas, Ltd., with the object of arriving at a mutually attractive scheme for the proving and development of these areas.

The partners in Trinidad Northern Areas, Ltd., are the Darcy Exploration Company, Ltd., the United British Oilfields of Trinidad, Ltd., and Trinidad Leaseholds, Ltd.

These negotiations have now reached the stage of agreement in principle and are on the basis that the initial exploratory drilling will be carried out by T.N.A. This entails, I need hardly say, specialized experience in marine drilling which T.N.A. is in a position to contribute, together with the extremely expensive plant and marine equipment necessary for such operations.

In consideration T.N.A. will receive a share in any oil produced and T.P.D. will be relieved of the risk and heavy cost of the initial proving operations.

The broad plan has, I know, the blessing of the Government of Trinidad and Tobago and it is, I venture to think, a happy solution of a formidable problem.

It will, I need hardly say, be two or three years at least before we shall know the outcome of the initial exploratory stage.

CHAIRMAN'S VISIT

I went out to Trinidad early this year with our managing director, Commander Lavington, and inspected all phases of the companies' activities and also had conversations with the Governor and leading Government officials. I have paid a number of such visits to the field since I became your chairman 16 years ago, and on each occasion I have noted with pleasure the progress made in all directions. My reactions on this occasion were no exception.

We owe a great debt to Commander Lavington, who was general manager in Trinidad throughout the period from 1937-46 in which this company was nursed from a rather rickety childhood to robust manhood. He was the man on the spot who set the standards of integrity, work, and loyalty in the formative years in which decisive progress was achieved. When he came back to London soon after the war to become managing director, he was a difficult man to follow in Trinidad, but his successor, Mr. Bennett, who took his place as general manager, has made an excellent job of it and a most notable contribution, not only to the affairs of this company, but also as a member of the Legislative Council of the Government of Trinidad and Tobago. Our warmest thanks are due to him and to his able and enthusiastic staff and to all who work for us in Trinidad. Their achievements in the realms of geology, field engineering, and drilling and operational technique have made a significant contribution to the success achieved in recent years.

From all that I have said you will appreciate that our affairs are in good order and that there is useful work to be done for many years to come. The results of those labours will depend, among other things, upon continued good management, reasonable success in the unending search for oil, and stable government in Trinidad. They will be affected for better or for worse by fluctuations in the price of oil and in the dollar/sterling exchange, since our oil is sold in terms of United States dollars and by reference to Gulf Coast export prices. Some of these factors are within our own control and some are on the lap of the gods.

The report and accounts were adopted.

Rand and O.F.S. October Returns

The Rand and O.F.S. gold mining returns for October did not contain results calculated to set the gold share market ablaze but results were generally satisfactory. Some assistance in maintaining or, in some cases, exceeding the preceding month's profit figures was given by the increase in the basic gold price from 247s. 10d. in September to 248s. in October. Small though this increase may be, to an industry faced with a vanishing premium for the sale of 40 per cent of its output aid in any shape or form is welcome. In this connection, the Union Government's decision to abandon the stipulation that gold offered on the free market must first be processed (discussed in these columns last week) will also help, although profit from premium sales is not included in the monthly returns.

The newer producers continued to do well. Western Holdings announced a higher mill throughput, a reduction in costs and a profit £7,300 higher. Welkom showed a modest improvement but costs rose from 46s. 8d. per ton to 48s. 2d. per ton milled. St. Helena continued to forge ahead and 73,000 tons were put through the mill for a profit of £35,100. Results from Stilfontein and West Driefontein were impressive.

Company	October, 1953 Tons (000)	Yield (oz.)	Profit (£000)	Yrds	Current Financial Year Total to Date Tons (000)	Yield (oz.)	Profit (£000)	Last Financial Year Total to Date Tons (000)	Yield (oz.)	Profit (£000)
Gold Fields										
Libanon	87	17,620	44·9	J	337	68,390	172·3	334	66,807	171·8
Luipaards Vlei	104	19,248	41·6	J	423	78,362	168·5	413	77,927	108·4
Rietfontein	27	6,002	24·3	D	267	59,600	251·4	270	60,173	275·5
Robinson	92	18,796	12·9	D	973	189,708	131·0	1123	185,417	121·2
Simmer & Jack	125	19,970	13·1	D	1223	97,710	128·1	1241	197,997	163·1
Sub Nigel	66	21,945	100·9	J	2665	88,512	412·5	270	93,251	492·3
Venterspost	103	24,303	56·3	J	416	97,492	224·8	422	96,536	256·4
Vlakfontein	38	13,674	75·9	D	368	133,642	718·9	374	138,771	793·0
Vogels	103	25,884	107·8	D	976	246,506	994·7	808	210,478	821·3
West Drei	45	32,747	260·6	J	177	125,173	1005·8	103	61,788	438·3
Anglo American*										
Brakpan	117	20,847	25·2	D	1149	205,588	225·3	1177	212,154	361·7
Daggas	214	50,158	311·0	D	2184	514,482	3293·5	2327	554,100	3908·5
East Daggas	95	16,225	49·9	D	914	158,549	486·5	958	170,787	624·5
S. A. Lands	101	18,516	52·3	D	1001	182,638	514·1	1104	198,949	698·7
Springs	140	19,254	8·5	D	1464	201,412	103·2	1642	215,979	190·2
Welkom	65	12,911	4·0	D	626	122,458	114·3	495	84,996	L 41·0
Western Hldgs	41	11,070	22·0	D	150	39,624	52·0	—	—	—
W. Reef Ex.	112	22,417	74·7	D	1090	222,844	795·1	1123	234,432	1027·8
Central Mining										
Blyvoor	103	60,928	506·5	J	409	242,100	2010·6	432	261,208	2281·5
City Deep	168	31,987	20·0	D	1594	308,570	216·2	1532	311,086	255·9
Consol M. R.	172	23 580	19·9	J	691	94,868	78·5	743	102,642	118·4
Crown	297	46,111	53·5	D	2726	432,197	415·3	2717	433,663	392·2
D. Roodeport	182	29,604	57·0	D	1787	299,827	638·7	1816	313,624	847·1
East Rand Prop.	197	45,138	131·9	D	1898	420,545	1117·1	2063	443,596	1457·1
Modder B.	55	6,022	2·8	D	544	58,252	17·8	566	62,531	63·6
Modder East	119	13,504	14·6	J	475	53,591	61·1	476	55,042	94·9
Rose Deep	73	10,681	10·6	D	731	108,663	85·1	832	115,742	99·5
Welgedacht	35	4,232	2·5	J	137	16,978	13·0	139	16,900	18·1
J.C.I.*										
E. Champ d'Or.	24	3,253	L 3·0	D	242	37,670	L 6·7	303	46,174	82·8
Govt. G.M.A.	260	33 110	40·0	D	2463	331,795	520·6	2453	322,102	505·2
New State	21	3,134	1·0	D	278	42,229	10·1	454	63,027	10·2
Randfontein	310	39,212	25·0	D	3063	391,297	267·0	3492	415,618	295·9
Wit Gold	20	2,889	L10·1	D	482	54,601	L 89·0	600	71,228	24·8
Freddies North†	27	4,867	L20·6	D	101	16,291	L 92·3	—	—	—
Freddies South†	27	4,449	L22·7	D	111	18,863	L 78·3	—	—	—
Union										
East Geduld	135	40,843	303·9	D	1357	407,776	3037·4	1452	435,642	3449
Geduld Prop.	92	14,895	26·4	D	947	150,471	314·5	1051	152,503	350·1
Grootvlei Prop.	185	39,317	226·9	D	1848	393,762	2311·3	1942	420,710	2695·4
Marievale	64	15,682	69·1	D	627	153,208	665·8	608	152,492	709·5
St. Helena	73	15,218	35·1	D	649	130,652	232·2	485	95,928	58·5
Van Dyk	80	13,835	2·0	D	868	141,772	10·5	1058	154,087	122·8
General Mining*										
S. Roodepoort	28	6,175	21·3	J	112	24,263	82·3	110	30,911	116·9
W. Rand Cons.	224	29,766	78·1	D	2227	309,201	866·7	2157	332,583	1242·2
Anglo Transvaal*										
N. Klerksdorp	11	1,485	0·3	D	105	14,241	6·1	113	12,806	10·2
Rand Leases	157	27,169	13·4	J	642	109,866	55·1	739	122,903	251·6
Village M. R.	34	5,244	12·0	J	136	21,256	48·0	135	21,166	59·5
Others										
N. Kleinfontein	112	14,134	23·3	D	1075	138,575	255·8	1072	140,107	313·8
Spaarwater	10	2,456	L 2·0	D	104	23,871	L 30·7	105	23,824	L 24·3
Stilfontein	69	21,045	110·3	D	638	186,108	924·2	183	50,268	76·3
W. Nigel*	17	3,979	8·1	J	68	15,557	30·5	67	—	28·9

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicates a loss. † Excluding development expenditure.

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